



E- Cigarettes

“Potential health impacts - Evidence Based Medicine Review 2020”



Gurpreet Bambra M.D.

Objectives



- ▶ Evidence based analysis of health impact of electronic cigarettes.
- ▶ E-cigarette or Vaping Product Use Associated Lung Injury (EVALI)

Who Smokes ? US Data

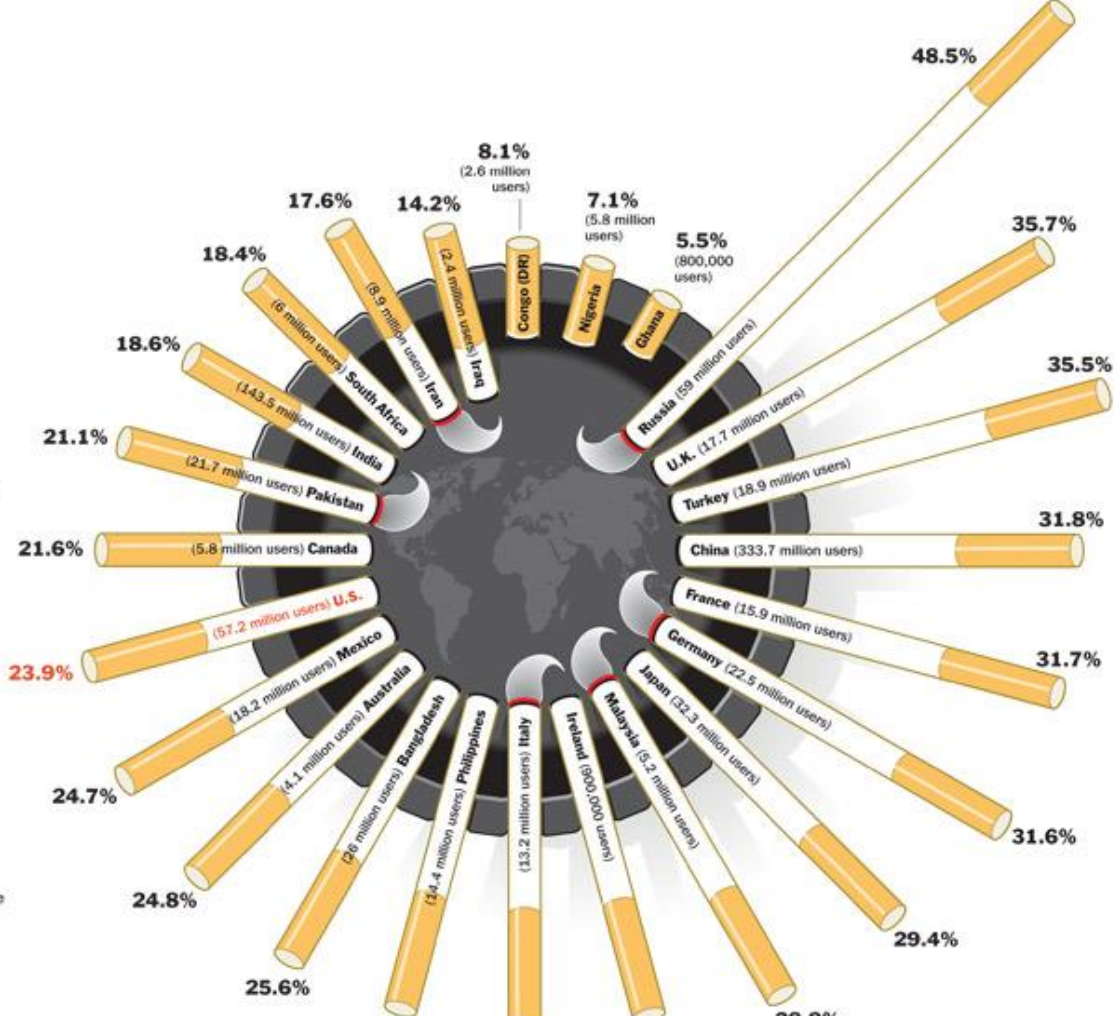
- ▶ Each day, more than **3,200** people under 18 smoke their first cigarette, and approximately **2,100** youth and young adults become daily smokers.
- ▶ 9 out of 10 smokers start before the age of 18, and **98% start smoking by age 26.**
- ▶ 1 in 5 adults and teenagers smoke.
- ▶ In 2011, an estimated 19% of U.S. adults were cigarette smokers.
- ▶ Approximately 18% of high school students smoke cigarettes.

- ▶ An estimated 42.1 million people, or 18.1% of adults in the United States smoke cigarettes.¹
- ▶ Cigarette smoking is more common among men (20.5%) than women (15.8%).¹
- ▶ Cigarette smoking is the leading cause of preventable death in the United States, accounting for more than **480,000 deaths**, or one of every five deaths, each year.²
- ▶ More than 16 million Americans suffer from a disease caused by smoking.²
- ▶ Overall smoking prevalence declined from 2005 (20.9%) to 2012 (18.1%).¹

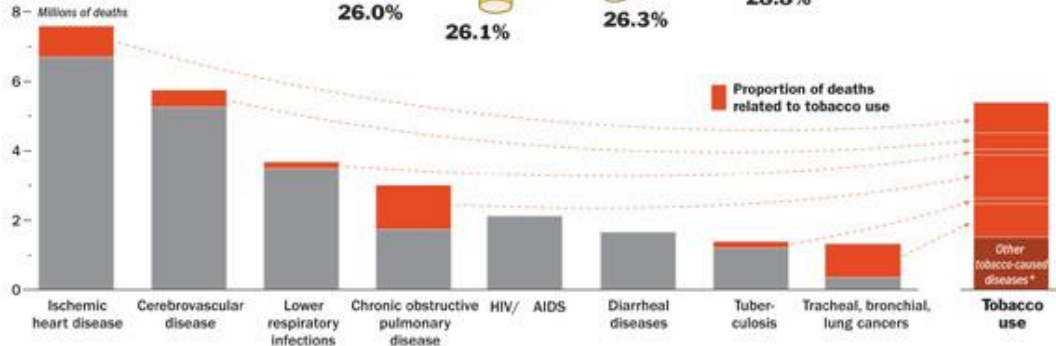
KEY
Cigarette length: Percentage of inhabitants ages 15 and older using tobacco as of 2005

(Total tobacco users in that country)
U.S. (137.2 million users)

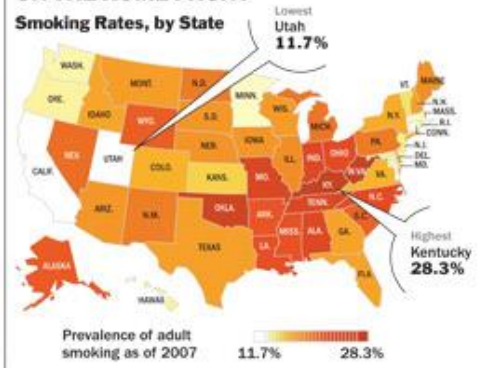
Smoke: Countries with increasing per capita cigarette consumption, 2002-06



LEADING CAUSES OF DEATH
At the world's current population, about 57 million people die each year. Smoking contributes to six of the top eight killers; snuff the butts, and you stop many of the deaths

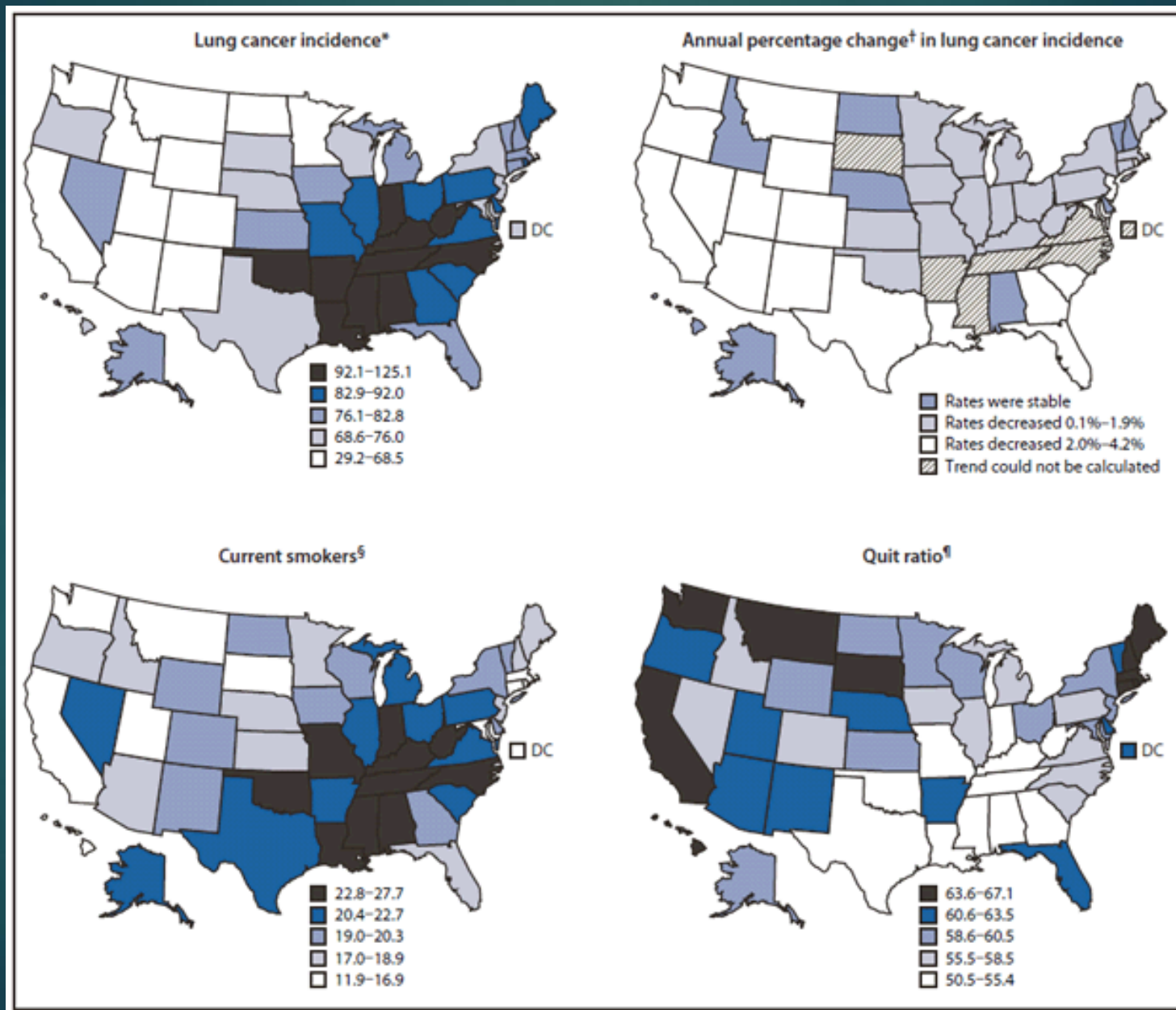


ON THE HOME FRONT



*Includes cancers of the mouth, oropharynx, esophagus, stomach and liver and other cardiovascular diseases
Sources: Centers for Disease Control and Prevention; Campaign for Tobacco-Free Kids; World Health Organization
TIME Graphic by Lon Reardon; research by Syley Correy

Lung cancer incidence and trends, and smoking behavior among men : 2008



Electronic Cigarettes.....

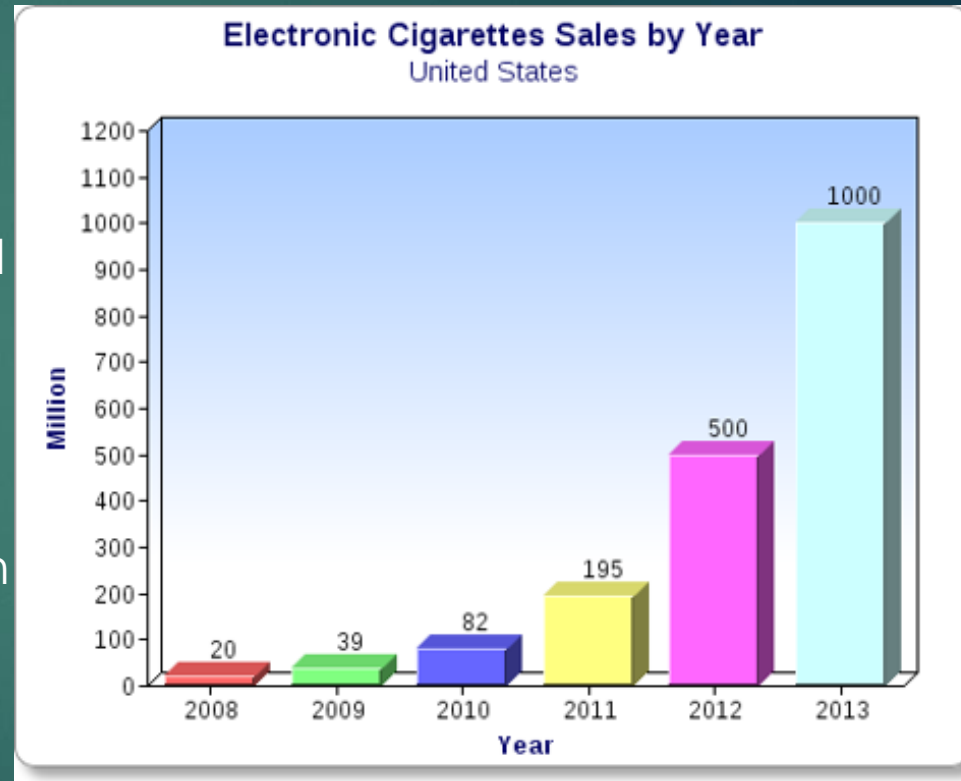


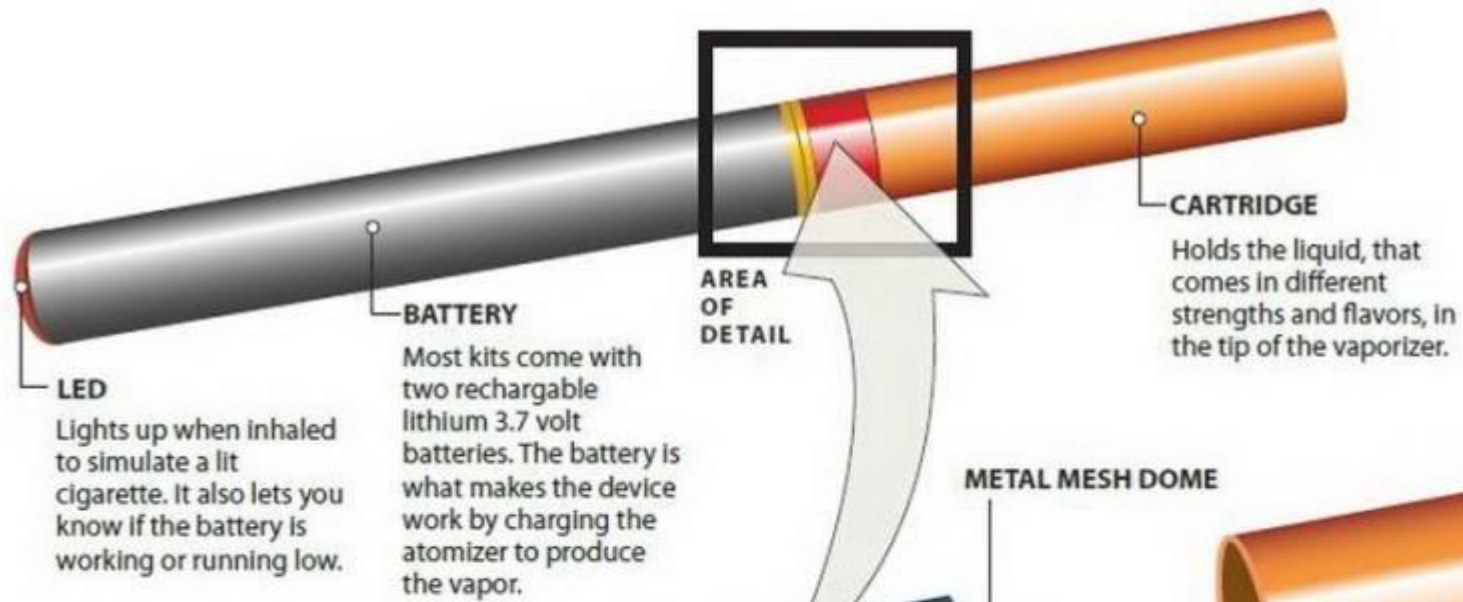
How many

- ▶ E-cigarettes are more safe ?
- ▶ E-cigarettes are less addictive/ have less nicotine?
- ▶ E-cigarettes are substitute for Nicotine replacement therapy
- ▶ Have used E-cigarettes ?
- ▶ Have prescribed E-cigarettes for smoking cessation ?
- ▶ Will consider to prescribe E-cigarettes in near future ?

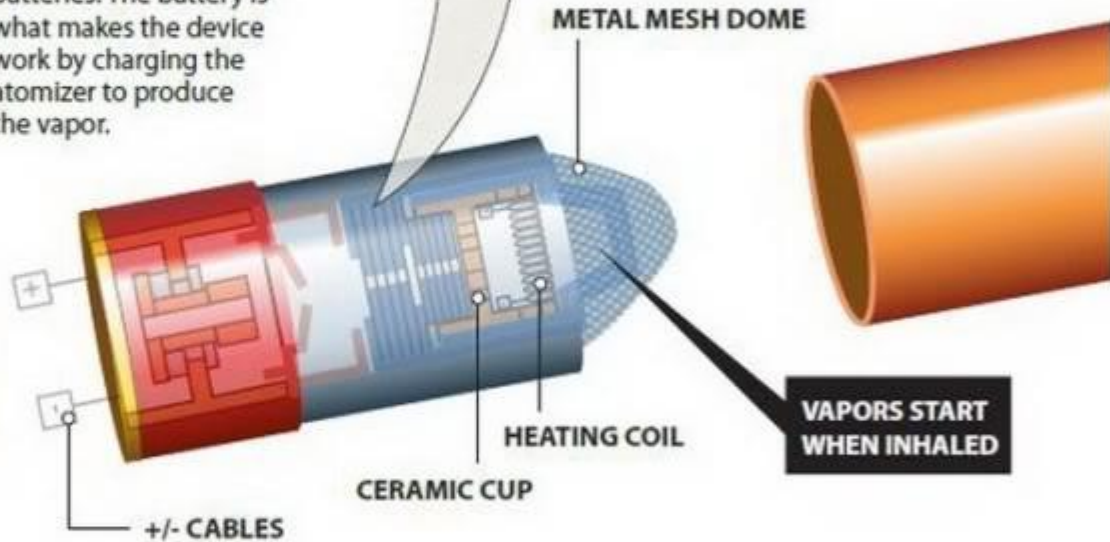
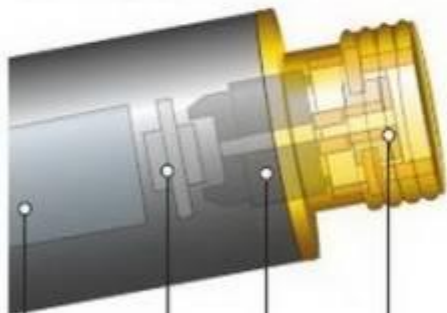
E-cigarettes a brief history

- ▶ Battery operated Nicotine delivery devices mimicking tobacco cigarette
- ▶ Introduced in 2003
- ▶ Portrayed in media as cessation aid
- ▶ Not approved by FDA
- ▶ But still advertised as “ safer alternative “
- ▶ TAR level is low , but they have been found to contain cytotoxic heavy metals
- ▶ Unregulated contents
- ▶ Long term effects are not known.





How it works

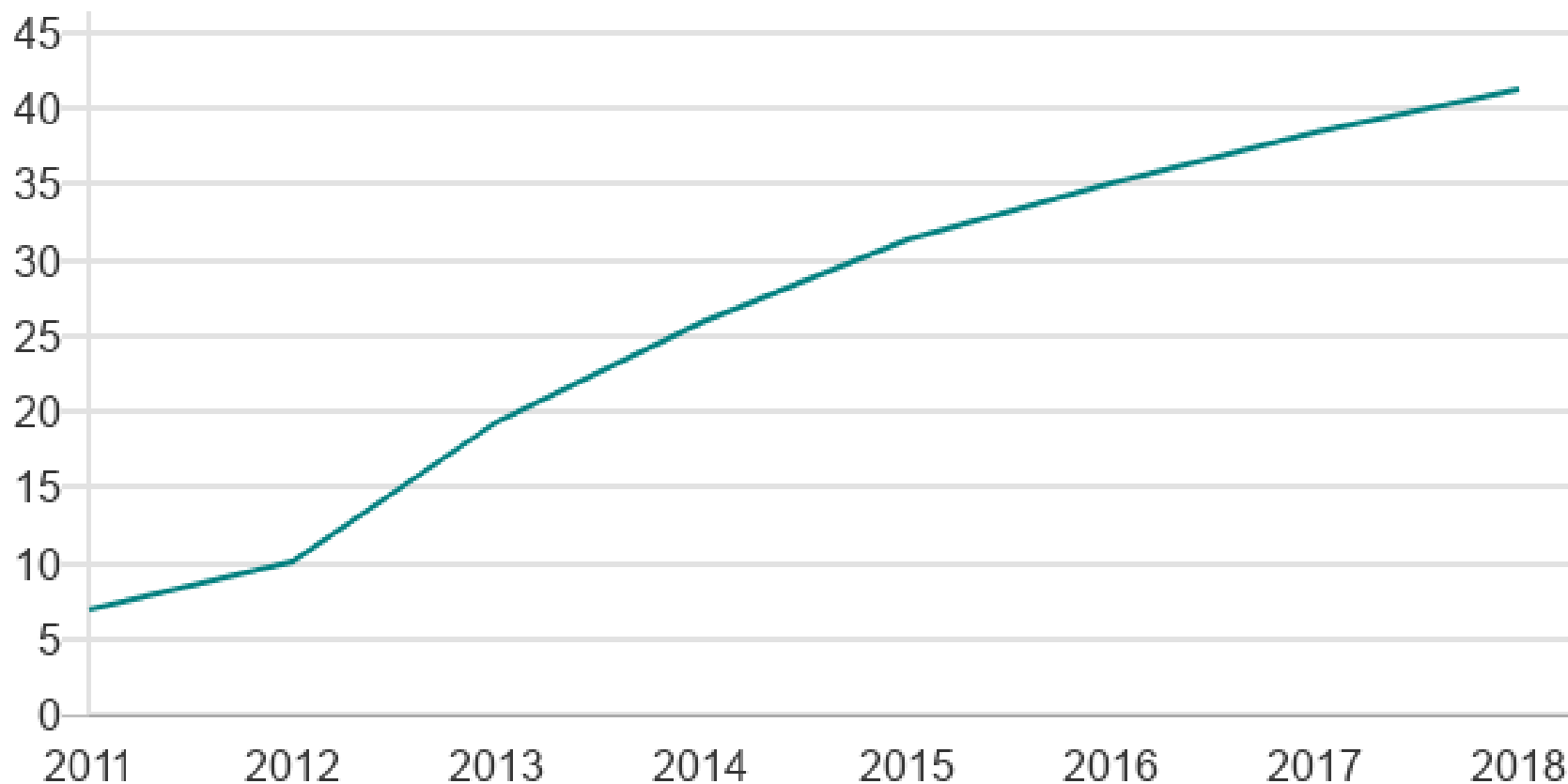


The atomizer

When a user inhales the personal vaporizer, the rechargeable battery in the device creates a solid contact with positive and negative wires inside the metal casing of the atomizer that turns it on to produce the vapor in the metal mesh dome. It then pulls the liquid from the cartridge to produce the vapor. The virtually odorless vapor that simulates smoke quickly dissipates in the air when exhaled.

Number of vapers globally

Adult smoking population of vapour products (millions)



Source: Euromonitor International

Mis(Advertisement) in past.....

Test, test and test, until we get the offer right...

A/B split copy and format testing will find which's best

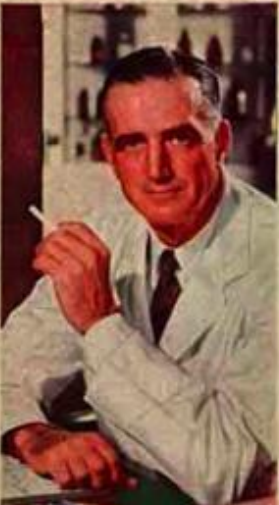

According to repeated nationwide surveys,

More Doctors Smoke **CAMELS** than any other cigarette!

Doctors in every branch of medicine were asked, "What cigarette do you smoke?" The brand named most was Camel!

You'll enjoy Camels for the same reason so many doctors enjoy them. Camels have cool, cool mildness, peak after peak, and a flavor unmatched by any other cigarette. Make this sensible test: Smoke only Camels for 30 days and you know we'll Camels please your taste, how well they suit your doctor as your steady smoker. You'll see how enjoyable a cigarette can be!

THE DOCTORS' CHOICE IS AMERICA'S CHOICE!


FOR 30 days, test Camels in your "T-Zone" (T for Throat, T for Taste).

*He's one of the busiest men in town. While his doctor may say *Dr. H. says 2 to 4*, he's actually on call 24 hours a day.*

The doctor is a scientist, a diplomat, and a friendly sympathetic human being all in one, no matter how long and hard his schedule.



According to a recent Nationwide survey:

MORE DOCTORS SMOKE CAMELS THAN ANY OTHER CIGARETTE

DOCTORS in every branch of medicine—113,597 in all—were queried in this nationwide study of cigarette preference. These leading research organizations made the survey. The gist of the query was—What cigarette do you smoke, Doctor? *The brand named most was Camel!*

The rich, full flavor and cool mildness of Camel's smooth blend of superior tobaccos seem to have the same appeal to the smoking tastes of doctors as to millions of other smokers. If you are a Camel smoker, this preference among doctors will hardly surprise you. If you're not—well, try Camels now.

Your "T-Zone" Will Tell You...

T for Taste ...
T for Throat ...

that's your proving ground for any cigarette. See if Camels don't suit your "T-Zone" in a "T."




CAMELS *Castler Tobaccos*

Testimonials and authority-figure endorsements always work well.

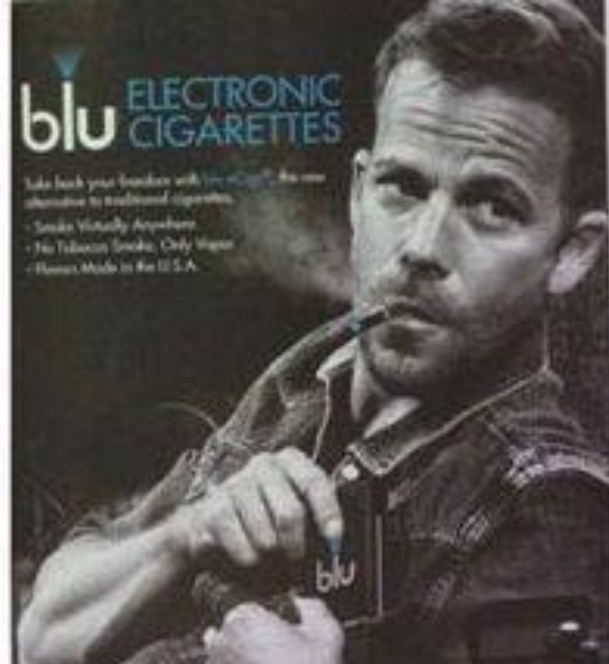
...and the trend still continues.



'Puff by puff...
Less tars... More taste...
Half-tar L&M'

Yes, today's
L&M gives
you... **Less tars**
& **More**

They said it couldn't be done... a pack with such rich, satisfying taste. But L&M did it. Immediately please your smoking. Then realize today's L&M is giving you a great gift before the L&M brand ever... the world's most cigarette tobacco.



blu ELECTRONIC CIGARETTES

Take back your freedom with blu eCigs™, the new alternative to traditional cigarettes.
• Smoke Virtually Anywhere
• No Tobacco Smoke, Only Vapor
• Flavor. Made in the U.S.A.



YES, YOU CAN
STOP SMOKING WITH
E-CIGARETTES

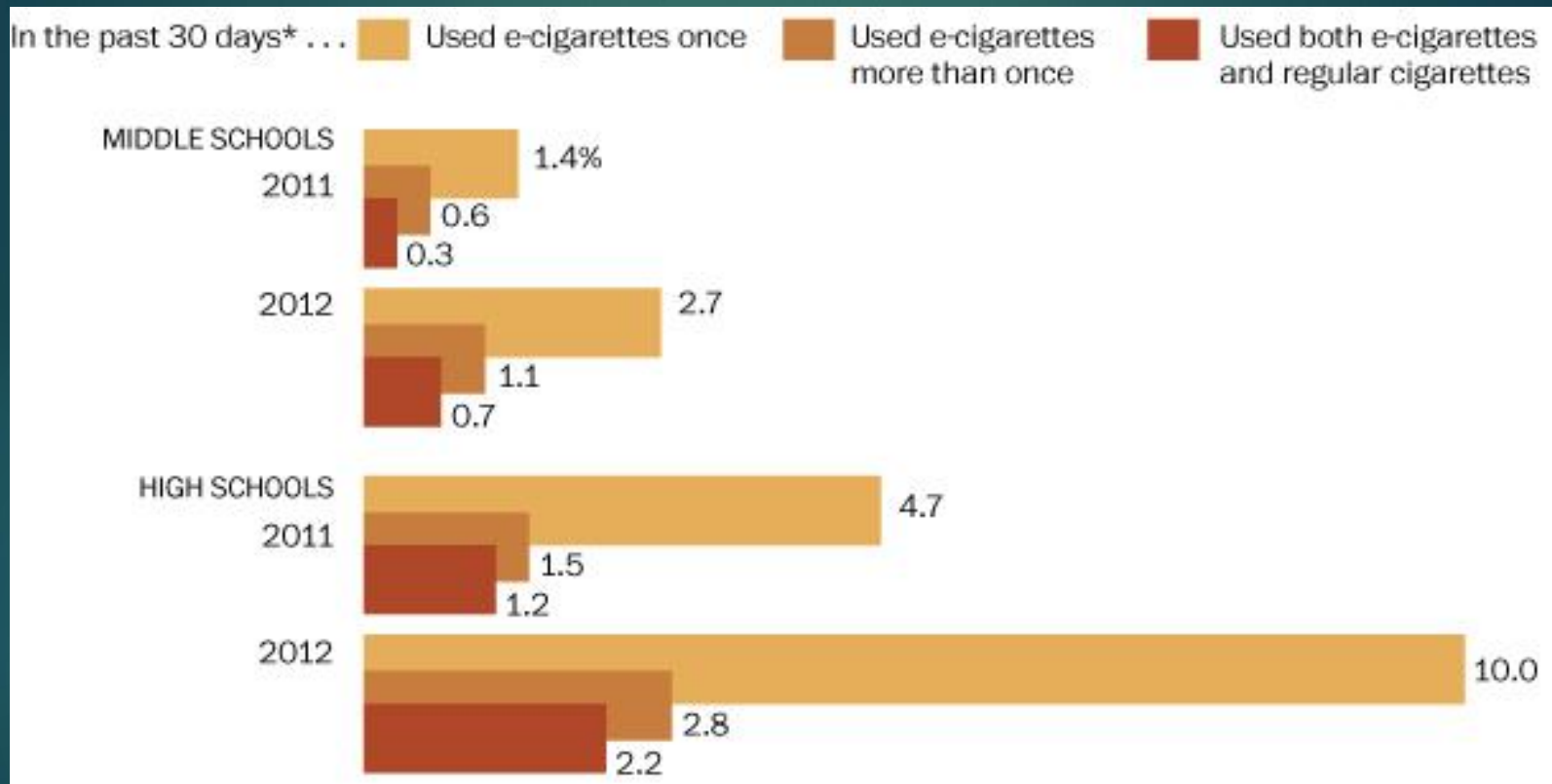
E-Cigarette Awareness and Perceived Harmfulness

Prevalence and Associations with Smoking-Cessation Outcomes

Andy S.L. Tan, MBBS, MPH, MBA, PhD, Cabral A. Bigman, PhD

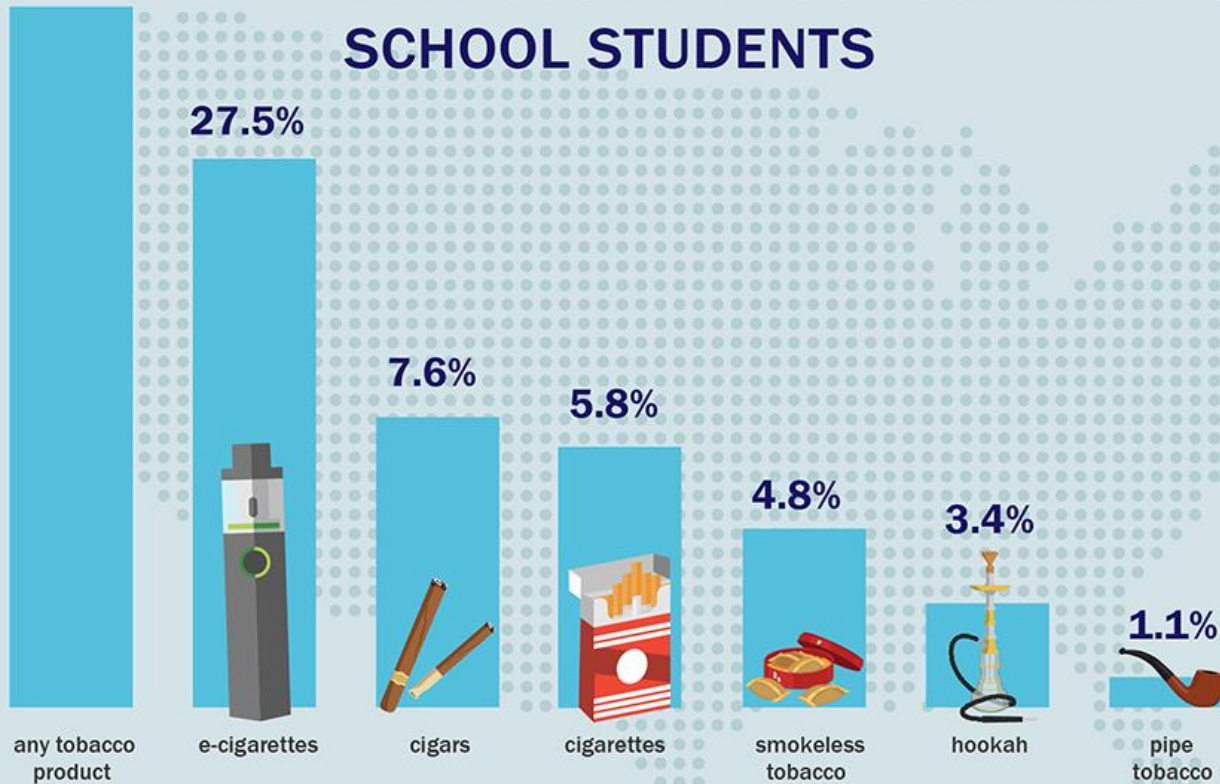
Predictor variables	Awareness of e-cigarettes (<i>n</i> =3,487) ^a		Believe e-cigarettes are less harmful (<i>n</i> =2,609) ^b	
	% (95% CI)	AOR (95% CI) ^c	% (95% CI)	AOR (95% CI) ^c
Overall	77.1 (74.5, 79.7)	—	50.7 (47.8, 53.7)	—
Age (years)				
18–34 (ref)	81.5 (74.7, 88.3)	1.00	60.1 (53.4, 66.8)	1.00
35–49	83.5 (80.3, 86.7)	1.00 (0.56, 1.79)	51.2 (45.5, 56.9)	0.62* (0.41, 0.94)
50–64	78.6 (74.4, 82.8)	0.73 (0.41, 1.29)	47.3 (43.4, 51.1)	0.55** (0.38, 0.81)
65–74	67.8 (61.9, 73.7)	0.38** (0.21, 0.69)	42.5 (36.0, 49.0)	0.48** (0.30, 0.79)
≥ 75	46.6 (40.1, 53.2)	0.18*** (0.10, 0.31)	27.5 (19.7, 35.3)	0.28*** (0.16, 0.47)
Gender				
Male (ref)	79.6 (76.0, 83.2)	1.00	58.4 (53.4, 63.4)	1.00
Female	75.6 (72.3, 78.8)	0.82 (0.65, 1.02)	42.9 (39.2, 46.5)	0.84 (0.50, 1.40)
Race/ethnicity				
White (ref)	81.3 (78.7, 84.0)	1.00	53.8 (50.1, 57.5)	1.00
African American	78.1 (73.1, 83.0)	0.82 (0.52, 1.29)	42.2 (32.0, 52.4)	0.61 (0.35, 1.07)
Hispanic	64.3 (54.9, 73.8)	0.38*** (0.24, 0.62)	53.5 (44.1, 63.0)	0.95 (0.64, 1.41)
Other	72.3 (53.2, 91.4)	0.60 (0.21, 1.73)	42.9 (30.8, 54.9)	0.57 (0.31, 1.08)
Education				
High school or below (ref)	65.0 (56.7, 73.2)	1.00	41.0 (28.2, 53.9)	1.00
Completed high school	72.8 (67.3, 78.3)	1.15 (0.69, 1.93)	45.9 (37.8, 54.0)	1.23 (0.65, 2.34)
Some college	80.3 (75.9, 84.8)	1.54 (0.90, 2.62)	51.4 (46.5, 56.3)	1.42 (0.77, 2.65)
College graduate or higher	81.8 (79.3, 84.2)	1.75* (1.07, 2.87)	57.1 (52.2, 62.0)	2.06* (1.06, 4.02)

Target them young Hit them hard!!



31.2%

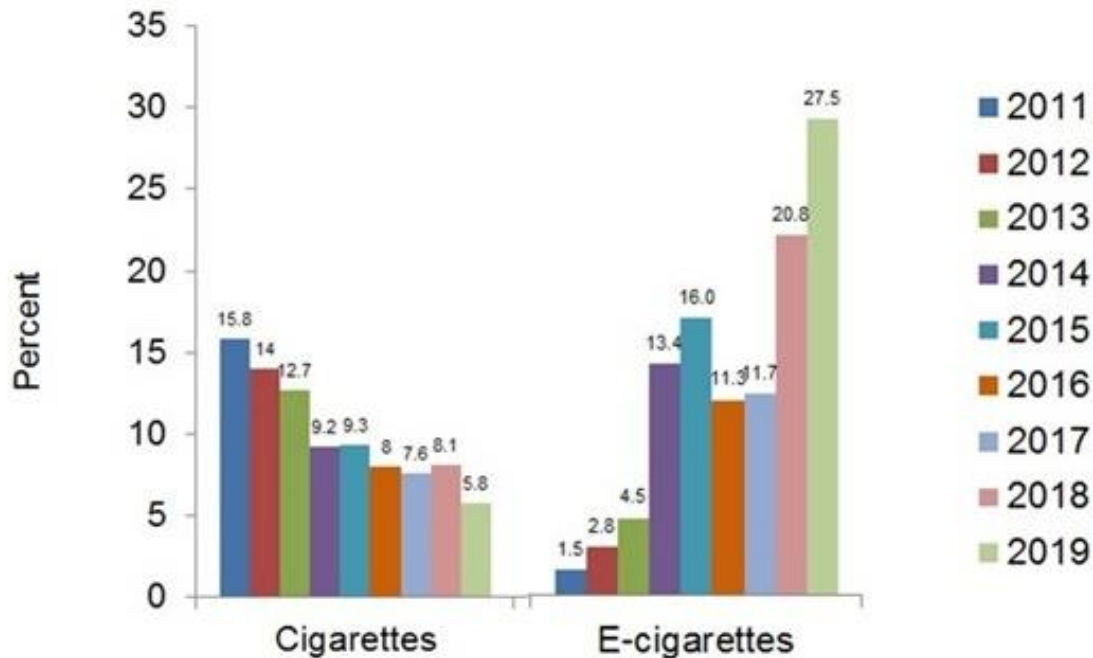
TOBACCO PRODUCT USE AMONG HIGH SCHOOL STUDENTS



Learn more at bit.ly/NYTS-2019

Source: National Youth Tobacco Survey, 2019

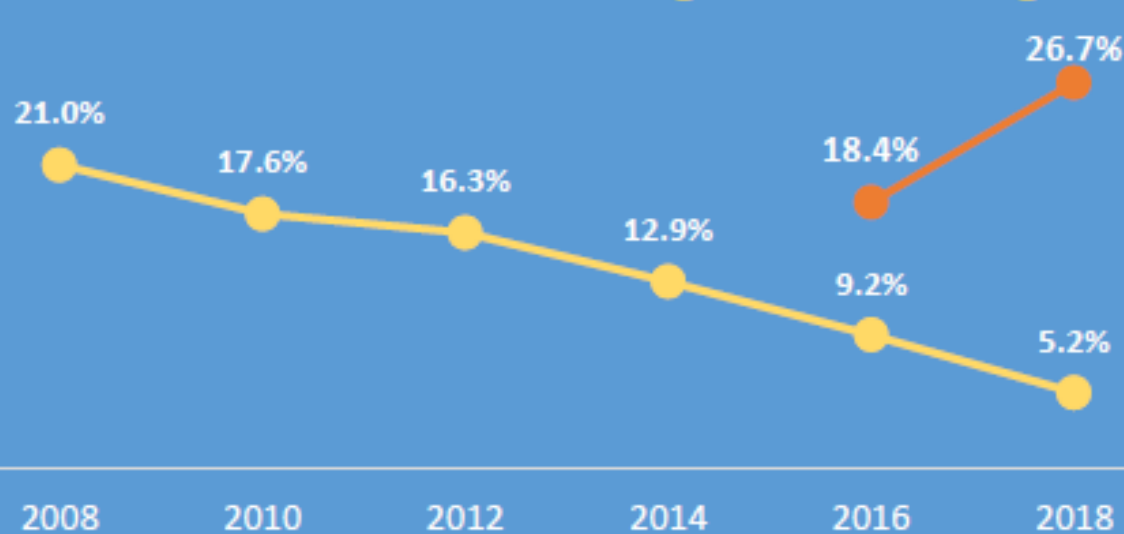
NATIONAL YOUTH TOBACCO SURVEY*: YOUTH USE OF E-CIGARETTES CONTINUES TO CLIMB



* *Preliminary data*
* Reported use within 30 days preceding administration of survey.



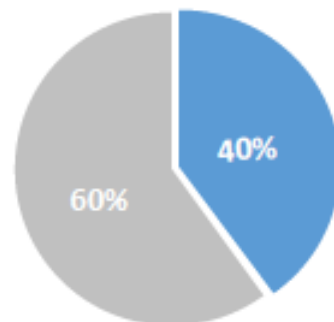
Among Illinois high school seniors, past 30 day **e-cigarette use** is significantly rising while **cigarette smoking** is declining.



E-cigarette use by high school seniors is **higher than cigarette use** was 10 years ago!

EDUCATION ON E-CIGARETTE USE IS NEEDED

Using e-cigarettes, like cigarette use, puts youth at **risk for addiction** and other health consequences*



About 40 percent of 10th and 12th graders said there was low or no risk of people harming themselves if they use e-cigarettes.



Reasons for Electronic Cigarette Use Among **Middle and High School**
Students — National Youth Tobacco Survey, United States, 2016
Weekly / **February 16, 2018**

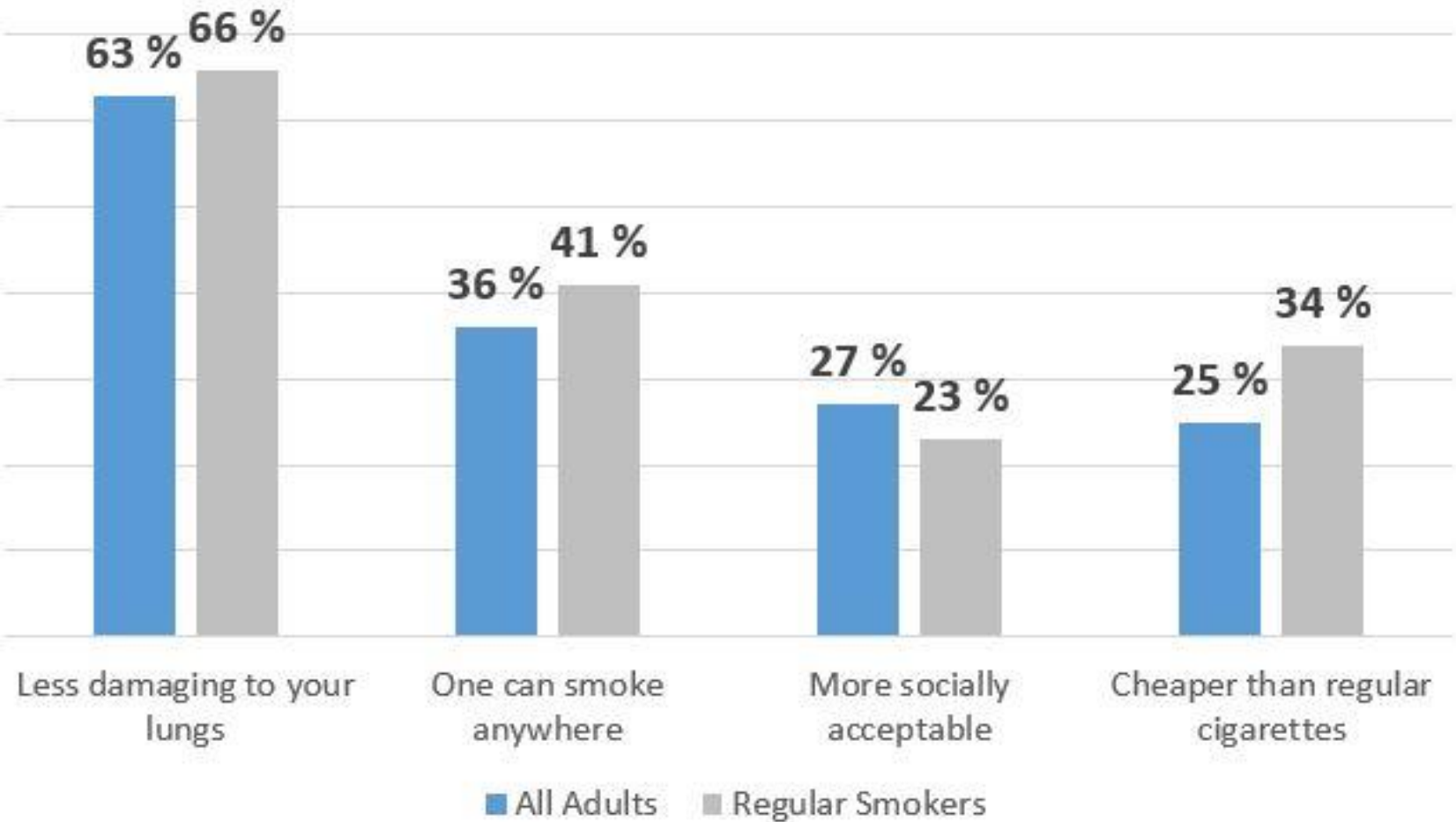
Participants were asked

“What are the reasons why you have used electronic cigarettes or e-cigarettes?”

- Friend or family member (39%)
- Availability of “flavors such as mint, candy, fruit, or chocolate (31%)
- The belief that “they are less harmful than other forms of tobacco such as cigarettes” (17%).

- Are easier to get than other tobacco products, such as cigarettes (5%)
- They cost less than other tobacco products such as cigarettes” (3%)
- famous people on TV or in movies use them (2%).

Perceived Benefits of E-cigarettes

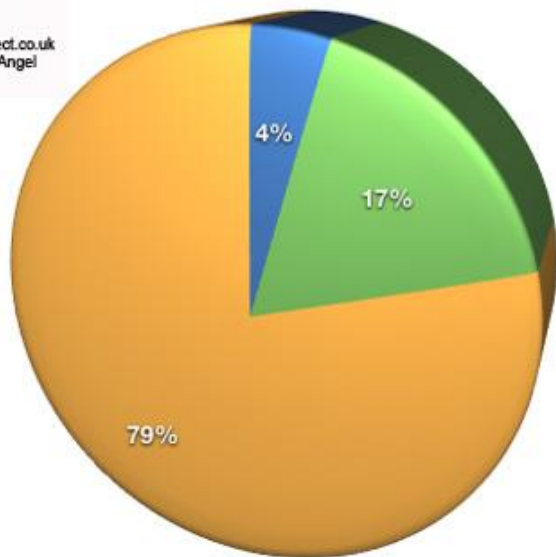


All Adults who report using / having used electronic cigarettes (2014) figures in %

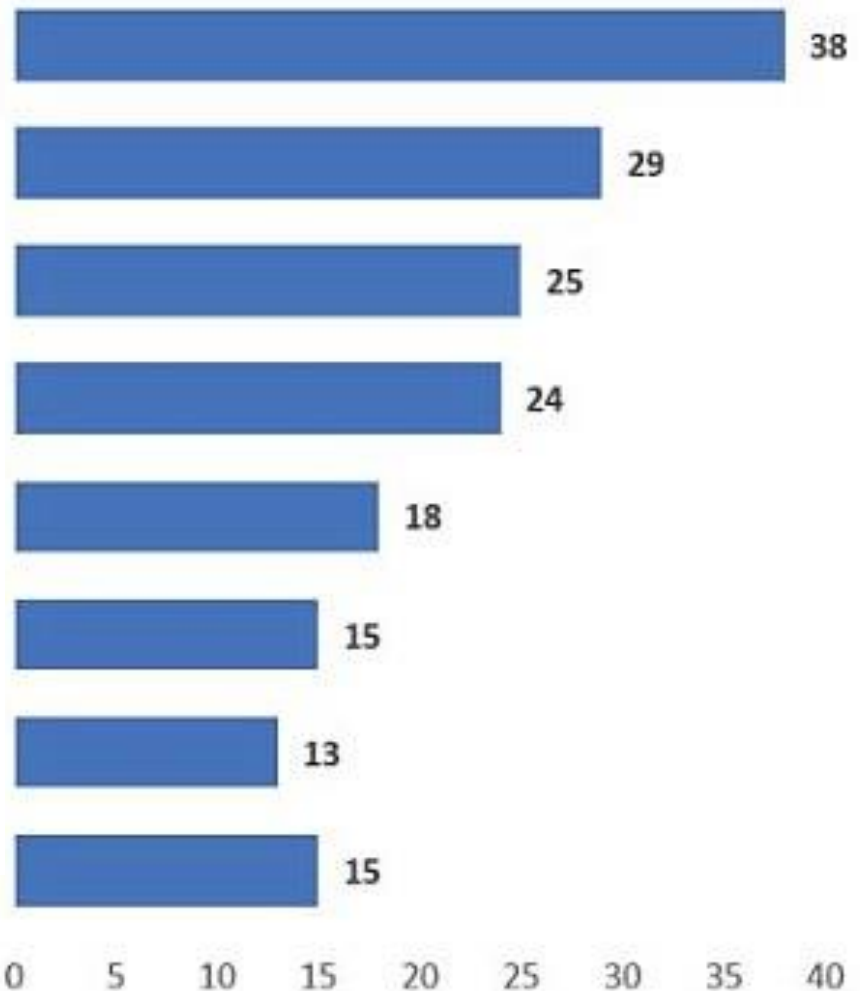
How vapers use electronic cigarettes:



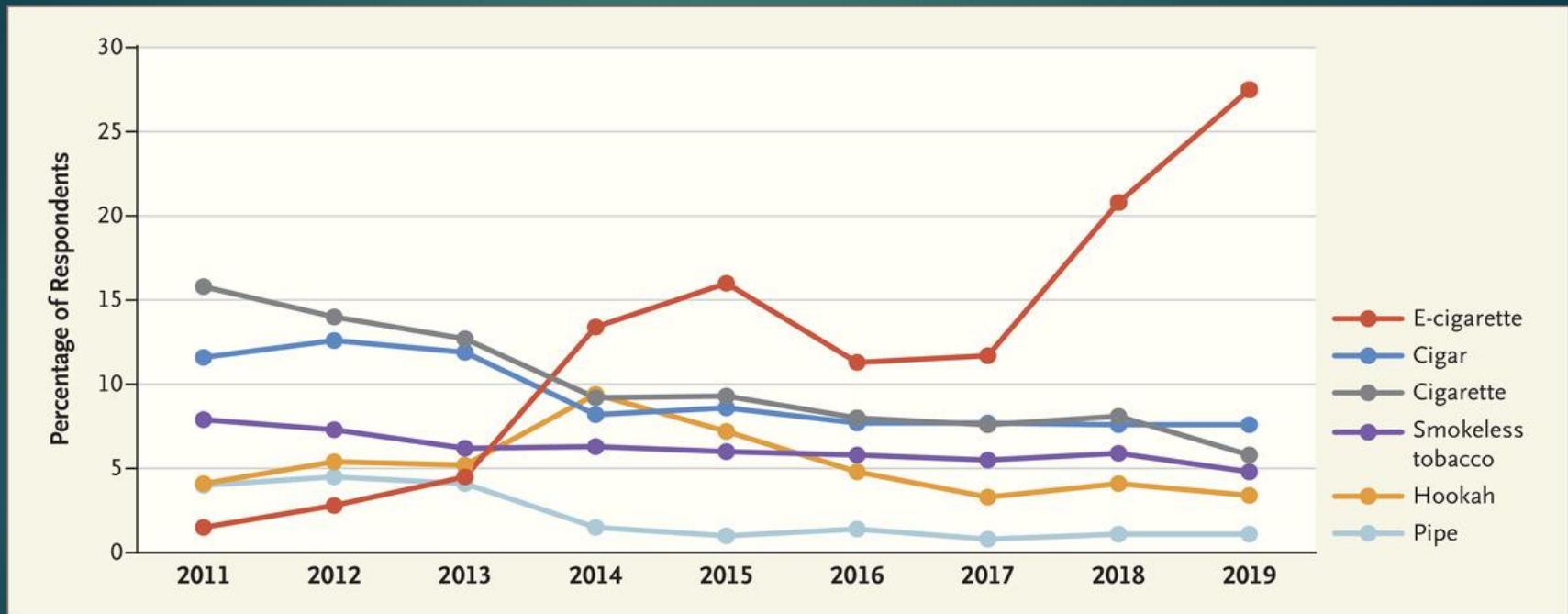
Datasource:
ECigaretteDirect.co.uk
The Smokers Angel



- In addition to cigarettes
- As a partial replacement to cigarettes
- As a complete replacement to cigarettes



Current Tobacco Product Use among U.S. High School Students, 2011 to 2019.



Product

Disposable e-cigarette



Rechargeable e-cigarette



Pen-style, medium-sized rechargeable e-cigarette



Tank-style, large-sized rechargeable e-cigarette

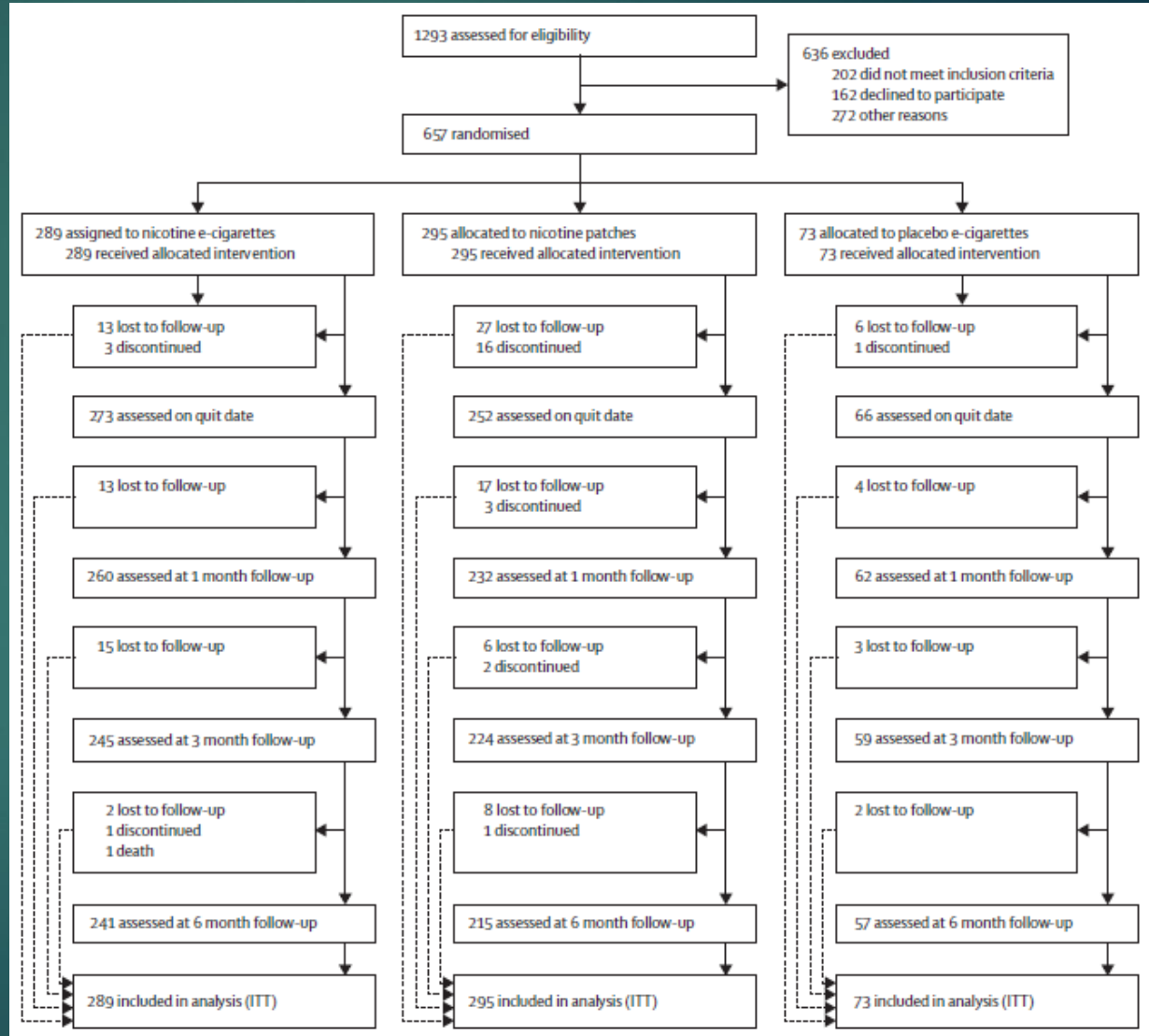


What is this ?



Electronic cigarettes for smoking cessation: a randomised controlled trial

Christopher Bullen, Colin Howe, Murray Laugesen, Hayden McRobbie, Varsha Parag, Jonathan Williman, Natalie Walker



Electronic cigarettes for smoking cessation: a randomised controlled trial

Christopher Bullen, Colin Howe, Murray Laugesen, Hayden McRobbie, Varsha Parag, Jonathan Williman, Natalie Walker

	Nicotine e-cigarettes (n=289)	Patches (n=295)	Placebo e-cigarettes (n=73)
Age (years)	43.6 (12.7)	40.4 (13.0)	43.2 (12.4)
Women	178 (62%)	182 (62%)	45 (62%)
Ethnicity*			
New Zealand Māori	95 (33%)	95 (32%)	23 (32%)
Non-Māori	194 (67%)	200 (68%)	50 (68%)
Education below year 12† or no qualification	150 (52%)	123 (42%)	38 (52%)
Average number of cigarettes (including RYO) smoked per day	18.4 (7.2)	17.6 (6.0)	17.7 (5.6)
Age started smoking (years)	15.6 (4.7)	15.2 (3.8)	15.7 (5.1)
Number of years smoking continuously	25.9 (13.1)	23.5 (12.9)	24.8 (13.7)
Type of tobacco usually smoked			
Factory made only	167 (58%)	167 (57%)	47 (64%)
RYO only	92 (32%)	92 (31%)	21 (29%)
Both	30 (10%)	35 (12%)	5 (7%)
Lives with other smokers	151 (52%)	149 (51%)	42 (58%)
At least 1 quit attempt in past 12 months	158 (55%)	169 (57%)	39 (53%)
FTND score	5.6 (2.0)	5.5 (2.0)	5.5 (2.0)
FTND >5 (high dependence)	157 (54%)	162 (55%)	40 (55%)
GN-SBQ score	20.1 (7.9)	20.1 (8.4)	21.4 (8.6)
Self-efficacy to quit‡	3.7 (1.0)	3.7 (0.9)	3.6 (1.0)
AUTOS total score	22.6 (7.2)	23.1 (7.6)	23.4 (7.3)

Data are mean (SD) or n (%). RYO=roll your own (loose tobacco) cigarettes. FTND=Fagerström test of nicotine dependence. GN-SBQ: Glover-Nilsson smoking behavioural questionnaire. AUTOS=autonomy over smoking scale; higher scores indicate greater dependence. *All non-Māori ethnicity categories aggregated as non-Māori. †Age 16 or 17 years. ‡Self-efficacy to quit=belief in ability to quit this time, measured on scale of 1 to 5, 1=very low, 5=very high.

Table 1: Baseline characteristics of participants

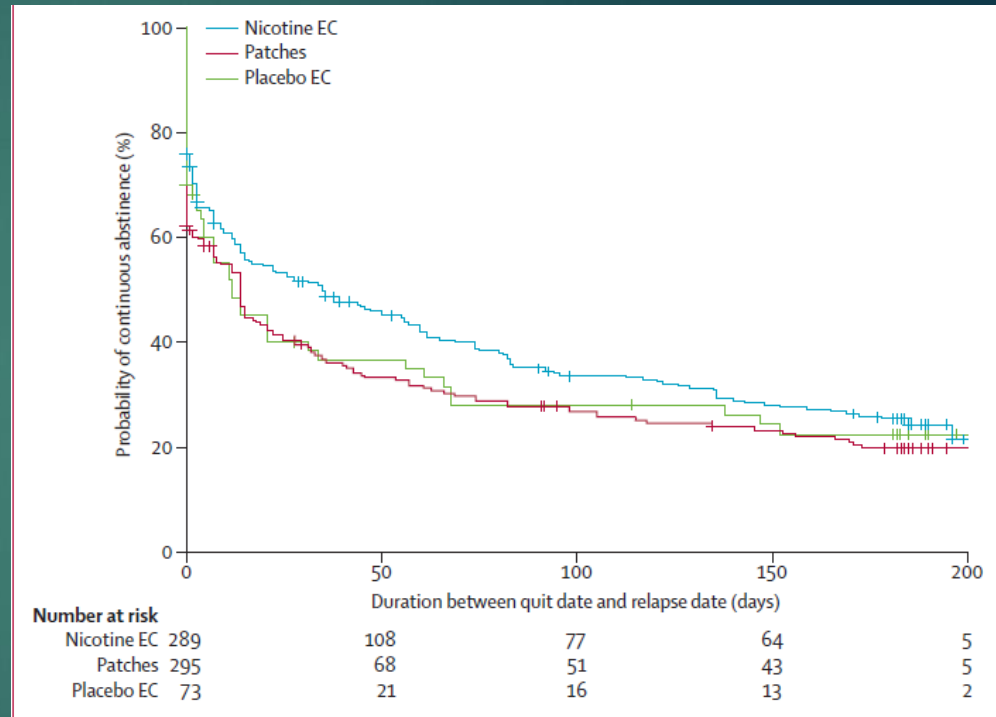
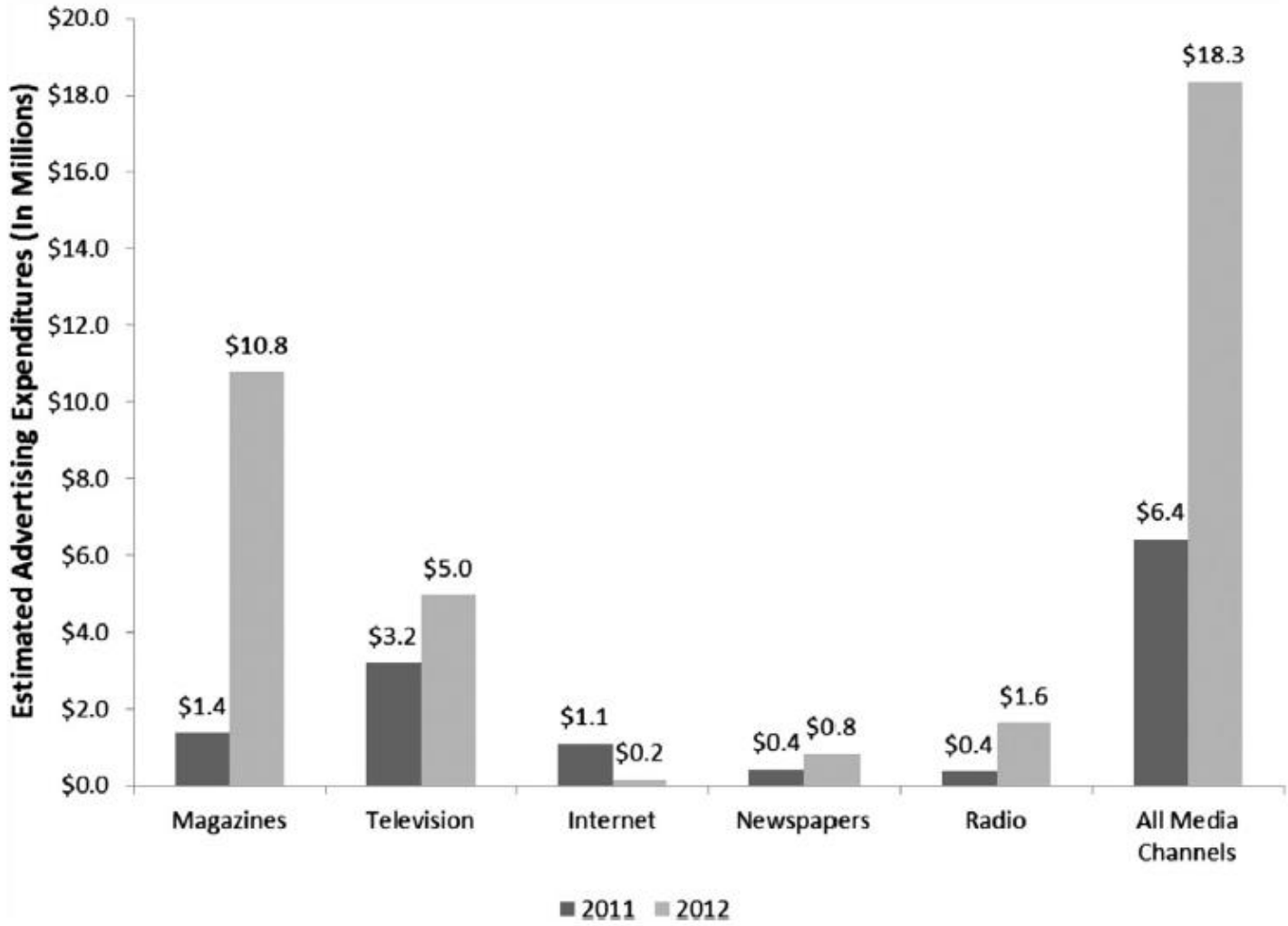


Figure 2: Kaplan-Meier analysis of time to relapse

E-cigarette Advertising Expenditures in the U.S., 2011-2012



Annice E. Kim, PhD, Kristin Y. Arnold, MSPH, Olga Makarenko, BA



Electronic cigarettes: navigating the vapor

Andrew S. Nickels, MD^{*}; Avni Y. Joshi, MD^{*†}; and Chitra Dinakar, MD[‡]

^{*}Division of Allergic Diseases, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota

[†]Division of Allergy and Immunology, Department of Pediatrics, Mayo Clinic, Rochester, Minnesota

[‡]Department of Pediatrics, University of Missouri–Kansas City, Faculty, Division of Allergy, Asthma, and Immunology, Children's Mercy Hospital, Kansas City, Missouri

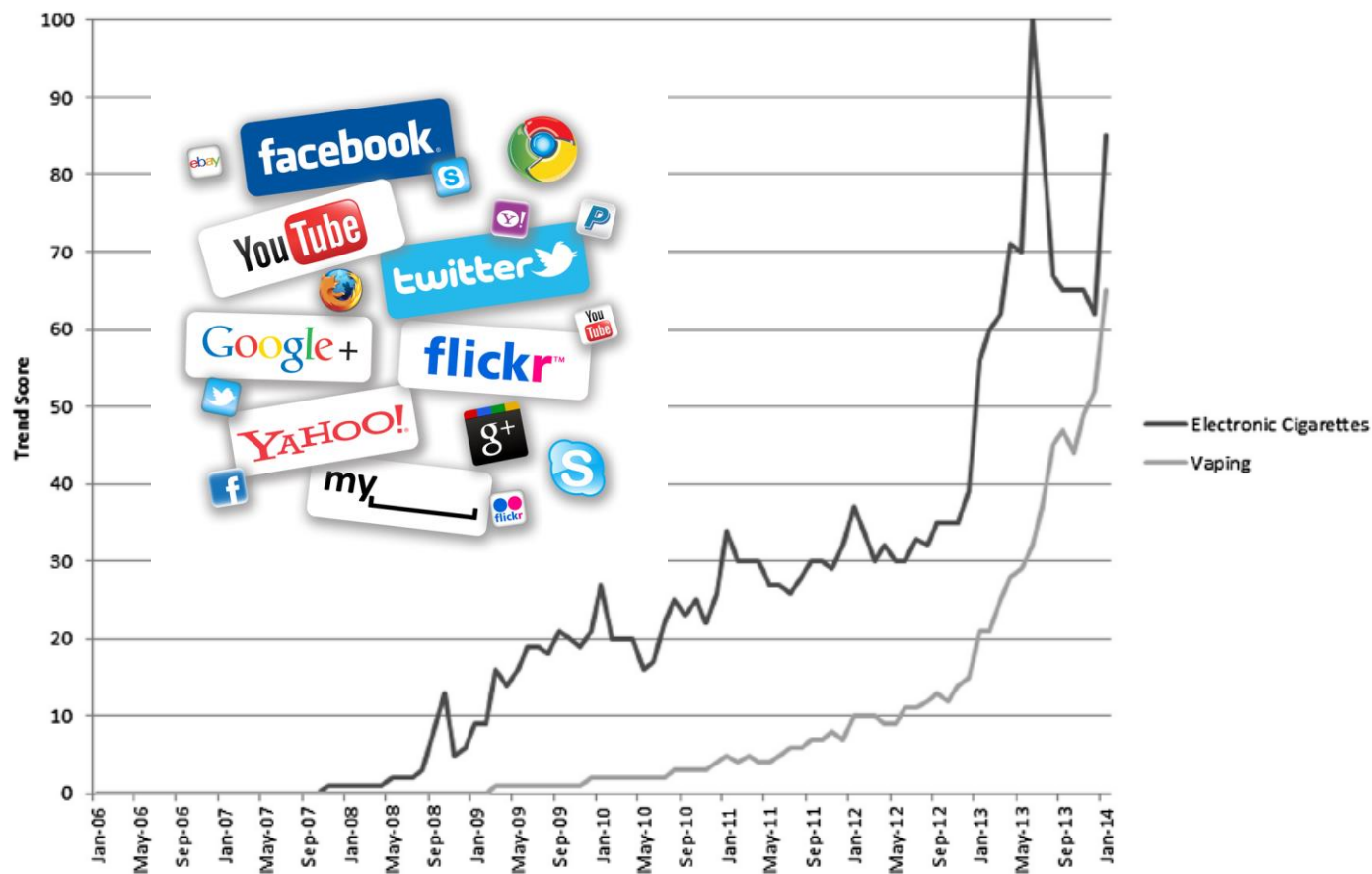


Figure 2. Google Trends: normalized search frequency worldwide—electronic cigarettes and vaping. Search frequency, normalized for regional variation by Google Trends, suggests a striking increase in Internet queries for *electronic cigarettes* and *vaping*.

“Smoking Revolution”

A Content Analysis of Electronic Cigarette Retail Websites

Rachel A. Grana, PhD, MPH, Pamela M. Ling, MD, MPH

Claim	Definition	Text example
Health related	Conveys health benefit, reduced harm, and/or no harm to one’s health from using the product (e.g., references to “tar” and other compounds in tobacco that are harmful, “healthier,” or “breathe easier,” pictures of doctors and other health symbols)	“Amerismoke electronic cigarettes are tar free and toxin free. Unlike traditional cigarettes which contain over 3,000 chemicals, with many of them being cancer-causing—Amerismoke is made up of around 3–4 ingredients. All of the ingredients used in Amerismoke are FDA approved and every batch of e Liquid we produce gets thoroughly tested for contaminants and toxins.” (www.amerismoke.com)
Cessation related	Conveys the product will help a tobacco smoker to quit smoking (e.g., explicit statements that the products can be used to quit smoking; use the product to cut down, switch completely, and never smoke again)	In the frequently asked questions section: “With all other alternative smoking products that are available on the market, you receive your dose of nicotine but they do not relieve your cravings for the actual process of smoking.... With Altimoff E Cigarette, quitting smoking is easier and less stressful than with any other product available on the market today.” (www.usaecigarette.com)
Ability to smoke anywhere	Refers to ability to use the product anywhere or almost anywhere; often includes lists of places where tobacco smoking is restricted: offices, planes, bars, and restaurants	“SMOKE’ ANYWHERE—EVEN AT THE PUB!” (www.liberro.co.uk)
Ability to circumvent smoke-free policies	Indicates that the products may be used to circumvent “smoke-free laws,” “smoke-free rules,” “clean indoor air regulations,” or “smoking bans”	“The dream has become a reality. Imagine, once again, being free to smoke in your favorite nightclub, restaurant, or shopping center. Movie theaters, sporting events, taxis, and even airplanes are all free smoking zones as long as you have Cigarti electronic cigarettes. Virtually everywhere that smoking has been prohibited, Cigarti can go.” (www.cigarti.com)

Unproven claims.... with catchy phrases

WHY QUIT? SWITCH TO BLU

blu is the smart choice for smokers wanting a change. Take back your freedom to smoke when and where you want without ash or smell. blu is everything you enjoy about smoking and nothing else. Nobody likes a quitter, so make the switch today.

Visit blucigs.com



blu

* New blu Smart Pack

PREMIUM ELECTRONIC CIGARETTE

18+ only. CALIFORNIA PROPOSITION 65 - **Warning:** This product contains nicotine, a chemical known to the state of California to cause birth defects or other reproductive harm.



Find Out How Megan Can...
Smoke Anywhere

Learn More

Cigarette Technology Alert

New Smoking Technology Featured On:
CNN, NBC, USNews, SCIENTIFIC AMERICAN

e-cigs
ELECTRONIC CIGARETTES



No Smell ~ Smoke Anywhere

TASTES & SMOKES BETTER THAN A
REAL CIGARETTE!

- No Toxic Chemicals!
- No Tar or Yellow Teeth
- No Smelly Clothes
- Smoke Anywhere!

Complete Kit!

Many Flavors.... Data on safety ?



Compares to:
Single Leaf Virginia Tobacco Brands
Included strengths: 1 x 18mg.



Compares to:
Turkish Tobacco Blend Brands
Included strengths: 1 x 18mg.



Compares to:
Multi-Leaf Tobacco Blend Brands
Included strengths: 1 x 18mg.



Compares to:
Menthol Blend Tobacco Brands
Included strengths: 1 x 18mg.



Included strengths: 1 x 18mg.



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Comparison of electronic cigarette refill fluid cytotoxicity using embryonic and adult models

Vasundhra Bahl^{a,b,c,1}, Sabrina Lin^{b,c,1}, Nicole Xu^{b,c,1,2}, Barbara Davis^c, Yu-huan Wang^{b,c}, Prue Talbot^{a,b,c,*1}

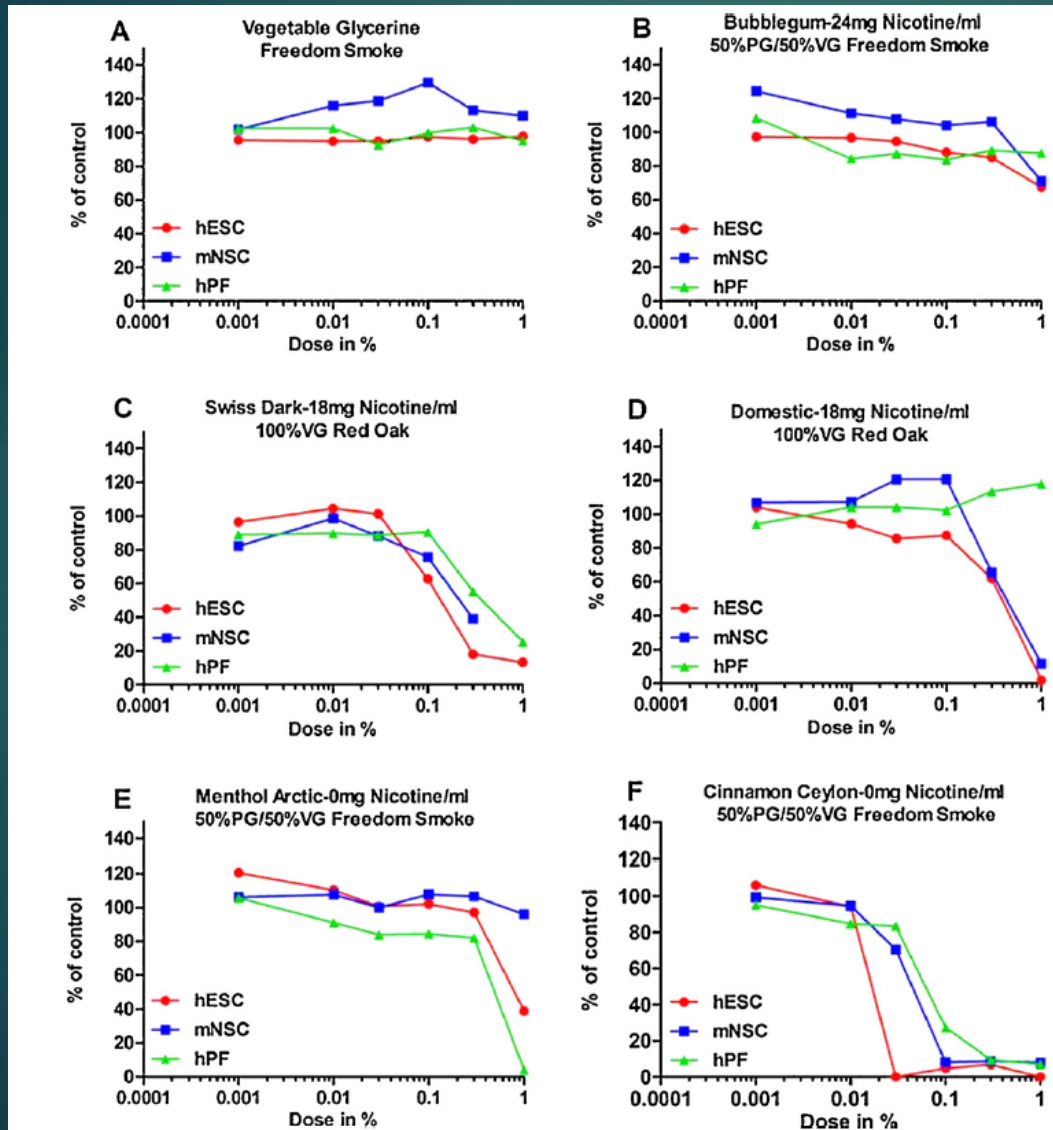
^a Environmental Toxicology Graduate Program, University of California, Riverside, CA 92521, United States

^b UCR Stem Cell Center, University of California, Riverside, CA 92521, United States



Dose-response curves showing representative examples of data obtained in the MTT cytotoxicity assay. Absorbance (percentage of the control) from the MTT assays plotted as a function of the refill fluid dose.

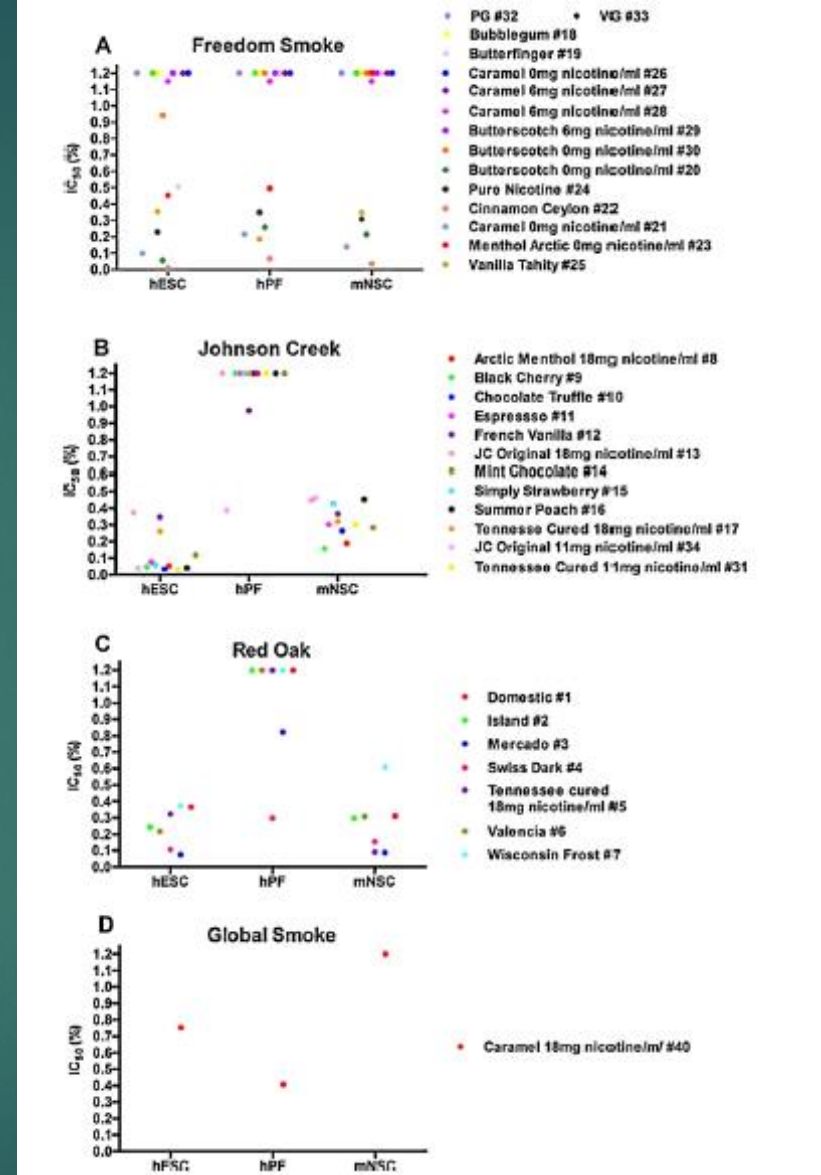
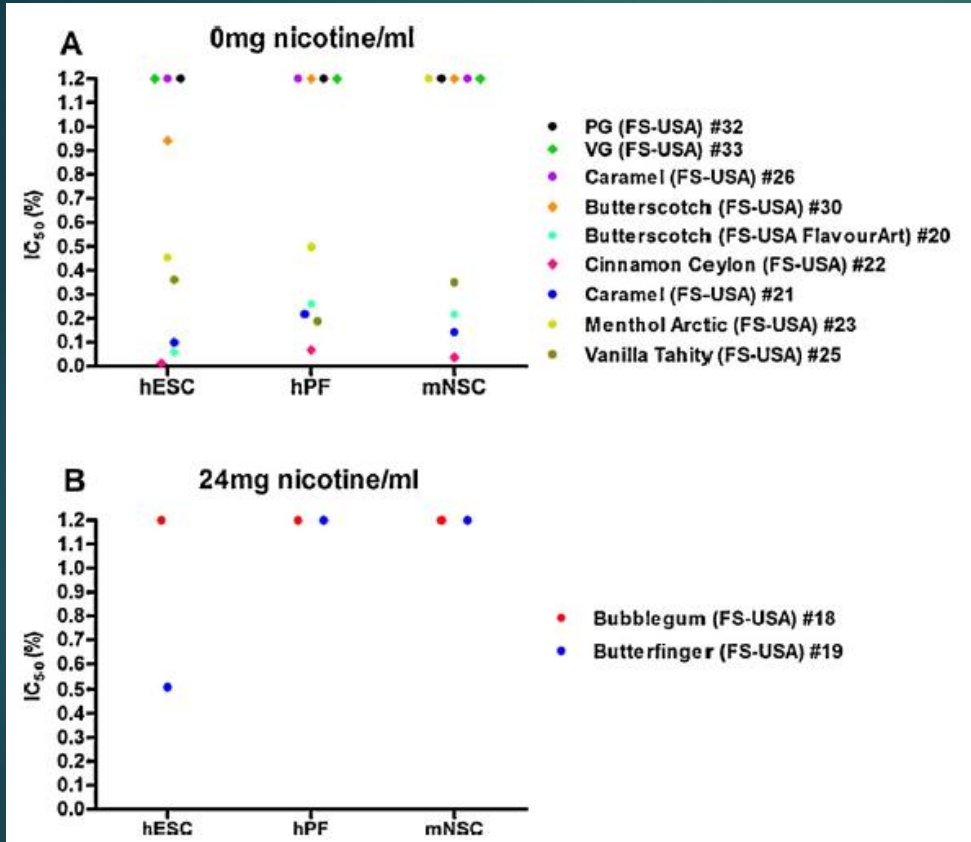
(A) Vegetable glycerin (non-cytotoxic),
 (B) Bubblegum (non-cytotoxic),
 (c) Swiss Dark (moderately cytotoxic),
 (D) Domestic (moderately cytotoxic to the stem cells),
 (E) Menthol Arctic (moderately cytotoxic the hPF),
 (F) Cinnamon Ceylon (highly cytotoxic).



Comparison of electronic cigarette refill fluid cytotoxicity using embryonic and adult models

Vasundhra Bahl^{a,b,c,1}, Sabrina Lin^{b,c,1}, Nicole Xu^{b,c,1,2}, Barbara Davis^c, Yu-huan Wang^{b,c}, Prue Talbot^{a,b,c,*,1}

^a Environmental Toxicology Graduate Program, University of California, Riverside, CA 92521, United States
^b UCR Stem Cell Center, University of California, Riverside, CA 92521, United States



Relationship between cytotoxicity and nicotine content .

Relationship between brand and cytotoxicity:

Conclusions from the study



- ▶ hESC were generally more sensitive to refill fluids than the other two cell types, and mNSC were generally more sensitive than hPF.
- ▶ No company emerged as having all non-cytotoxic or all cytotoxic refill products.
- ▶ Samples from Johnson Creek and Red Oak, which were generally cytotoxic to stem cells and non-cytotoxic to lung fibroblasts.
- ▶ There was no correlation between cytotoxicity and nicotine concentration for the dose range used.
- ▶ Each refill product needs individual evaluation to determine cytotoxicity, preferably using multiple cell types.
- ▶ Within a particular flavor, cytotoxicity was highly variable, even when the flavor came from a single manufacturer
- ▶ Two different bottles from the same manufacturer with identical Butterscotch labels (#20 and 41) had slightly different chemical composition and significantly different amounts of the two major flavoring chemicals

Use of electronic cigarettes (e-cigarettes) impairs indoor air quality and increases FeNO levels of e-cigarette consumers

Wolfgang Schober^{a,*}, Katalin Szendrei^a, Wolfgang Matzen^a, Helga Osiander-Fuchs^b, Dieter Heitmann^c, Thomas Schettgen^d, Rudolf A. Jörres^e, Hermann Fromme^a


^a Bavarian Health and Food Safety Authority, Department of Chemical Safety and Toxicology, Pfarrstrasse 3, 80538 Munich, Germany

^b Bavarian Health and Food Safety Authority, Department of Cosmetics and Tobacco Products, Veterinärstrasse 2, 85764 Oberschleissheim, Germany

- ▶ Despite the recent popularity of e-cigarettes, only limited data is available on their safety for both users and secondhand smokers
- ▶ Study reports a comprehensive inner and outer exposure assessment of e-cigarette emissions in terms of



- ▶ In six vaping sessions nine volunteers consumed e-cigarettes with and without nicotine in a thoroughly ventilated room for two hours.



Use of electronic cigarettes (e-cigarettes) impairs indoor air quality and increases FeNO levels of e-cigarette consumers

Wolfgang Schober^{a,*}, Katalin Szendrei^a, Wolfgang Matzen^a, Helga Osiander-Fuchs^b, Dieter Heitmann^c, Thomas Schettgen^d, Rudolf A. Jörres^e, Hermann Fromme^a

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- ▶ The concentration of putative carcinogenic PAH in indoor air increased by 20% to 147 ng/m³, and aluminum showed a 2.4-fold increase.
- ▶ PNC ranged from 48,620 to 88,386 particles/cm³(median), with **peaks at diameters 24–36 nm**.
- ▶ FeNO increased in 7 of 9 individuals.
- ▶ The nicotine content of the liquids varied and was 1.2-fold higher than claimed by the manufacturer.

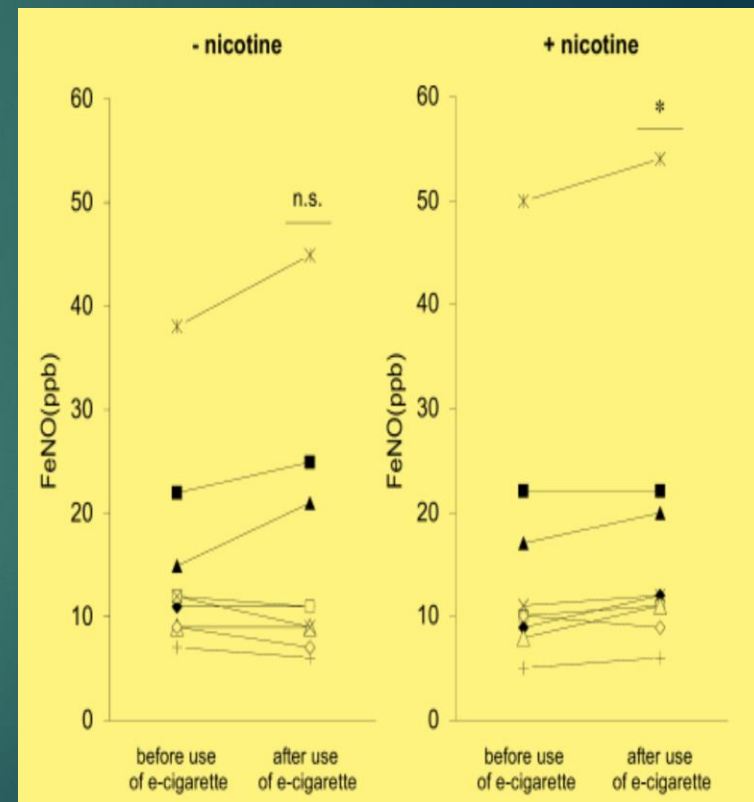
Use of electronic cigarettes (e-cigarettes) impairs indoor air quality and increases FeNO levels of e-cigarette consumers

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- ▶ Data confirm that e-cigarettes are not emission-free and their pollutants could be of health concern for users and secondhand smokers.
- ▶ In particular, ultrafine particles formed from supersaturated 1,2-propanediol vapor can be deposited in the lung, and aerosolized nicotine seems capable of increasing the release of the inflammatory signaling molecule NO upon inhalation



Variable and potentially fatal amounts of nicotine in e-cigarette nicotine solutions

Jennifer M Cameron,¹ Donelle N Howell,¹ John R White,² David M Andrenyak,^{3,4} Matthew E Layton,¹ John M Roll¹

Table 1 Replicate and mean nicotine concentration analyses for e-cigarette nicotine solutions

Sample ID	Brand*	Expected concentration level	Nicotine (mg/ml)			
			Replicate analyses			Mean (\pm S.D.)
			1	2	3	
A	Vapour liquid (high)	24 mg/ml (marked)	19.8	21.2	16.3	19.1 (\pm 2.52)
B	No brand, hand-labelled liquid (high)	25–36 mg/ml (est.)	12.4	12.1	12.4	12.3 (\pm 0.17)
C	Smart smoke liquid (high)	25–36 mg/ml (est.)	13.2	13.5	12.7	13.1 (\pm 0.40)
D	Smart smoke liquid (med)	10–18 mg/ml (est.)	12.7	11.2	11.9	11.9 (\pm 0.75)
E	Smart smoke liquid (low)	6–14 mg/ml (est.)	8.3	8.6	8.5	8.5 (\pm 0.16)
F	BE112 prefilled cartridge (super high)	25–36 mg/ml (est.)	19.8	20.4	19.5	19.9 (\pm 0.46)
G	Vapour prefilled cartridge (high)	24 mg/ml (marked)	22.4	22.7	21.5	22.2 (\pm 0.62)

Precision and accuracy of the LC-MS analyses for the quality control test solutions were as follows: Low: target concentration=20 ng/ml, measured nicotine mean (SD)=18.5 (\pm 0.95); Medium: target concentration=300 ng/ml, measured nicotine mean=301.4 (\pm 6.05); High: target concentration=1300 ng/ml, measured nicotine mean=1314 (\pm 42.5).

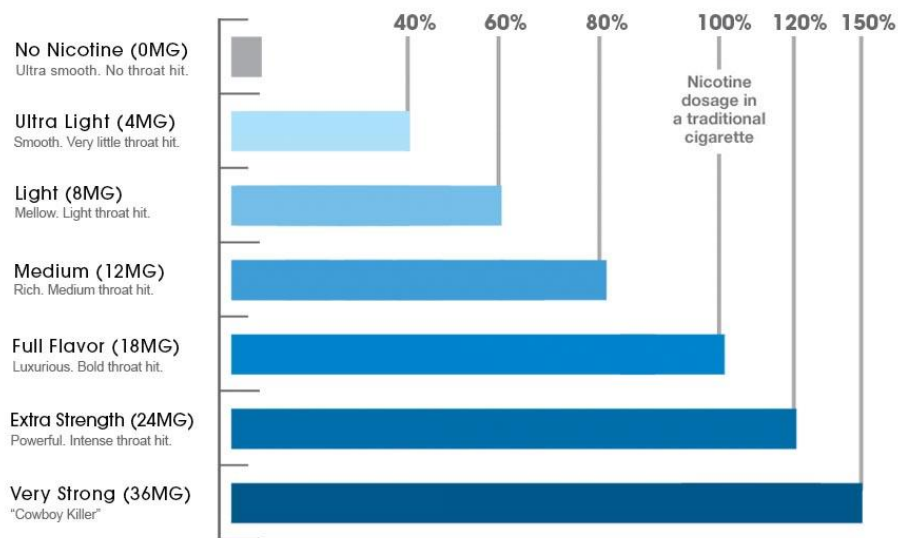
*Nicotine solutions were obtained from local vendors in Spokane, Washington, USA. All labelled brands (Vapour, Smart Smoke, BE112) were also found available for purchase on the internet. Information on country of manufacture was only found for Vapour (USA).

Safe ? Are you sure ?

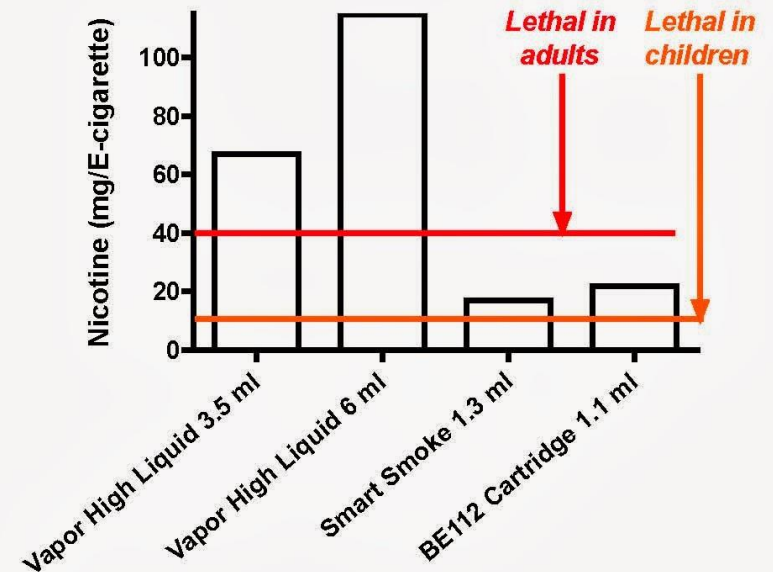
Nicotine Level Chart

We recommend all new customers start with 18 mg, this is the most comparable to a cigarette, and will perform the best for someone coming off of cigarettes. We do however have other levels of nicotine, which allow you to choose your level of intensity. Use this chart below to decide whats best for you.

Nicotine has a lot to do with how an electronic cigarette performs. This is commonly referred to as "throat hit." Because of this, dont jump to far up or down the scale, for instance if you are currently on "18", we suggest you try "12" or "24" before any other nicotine strength. This would be one level up or down.



E-cigarette nicotine content by brand, estimated from Cameron et al., Tobacco Control, in press.



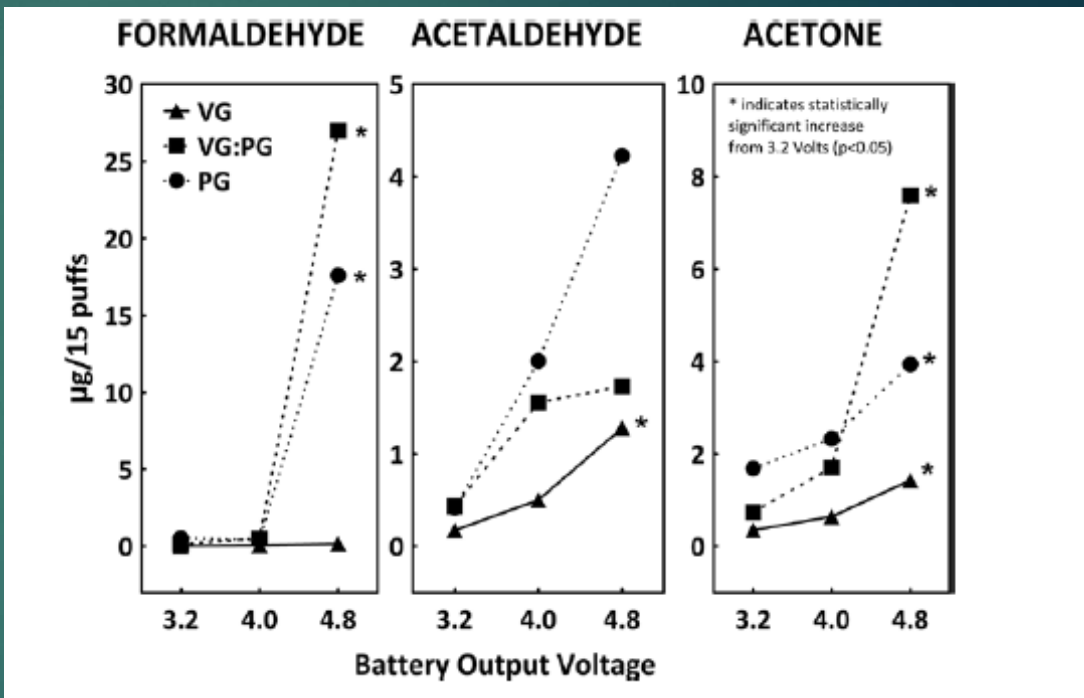
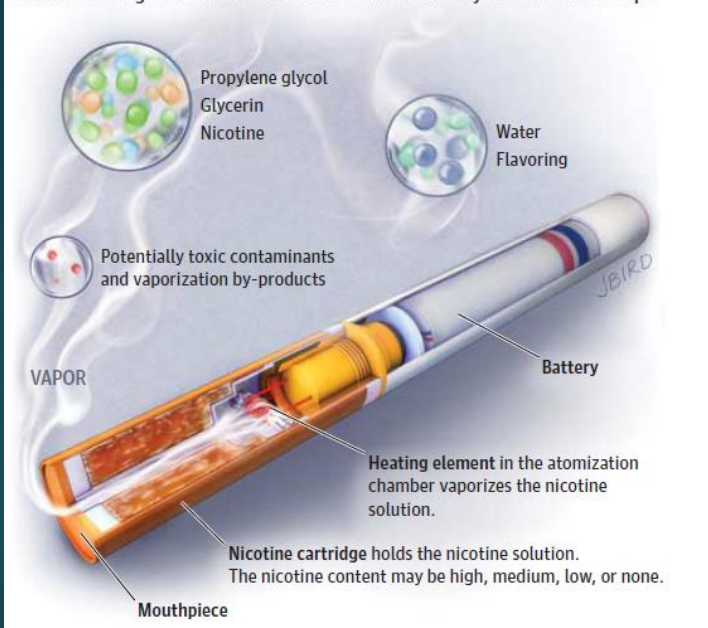
Carbonyl Compounds in Electronic Cigarette Vapors— Effects of Nicotine Solvent and Battery Output Voltage

Leon Kosmider PharmD^{1,2}, Andrzej Sobczak PhD^{1,2}, Maciej Fik PharmD², Jakub Knysak PharmD², Marzena Zaciera PhD¹, Jolanta Kurek PhD¹, Maciej Lukasz Goniewicz PharmD, PhD³

¹Department of Chemical Hazards and Genetic Toxicology, Institute of Occupational Medicine and Environmental Health, Sosnowiec, Poland; ²Department of General and Inorganic Chemistry, School of Pharmacy, Medical University of Silesia, Katowice, Poland; ³Department of Health Protection, National Institute of Hygiene, Warsaw, Poland



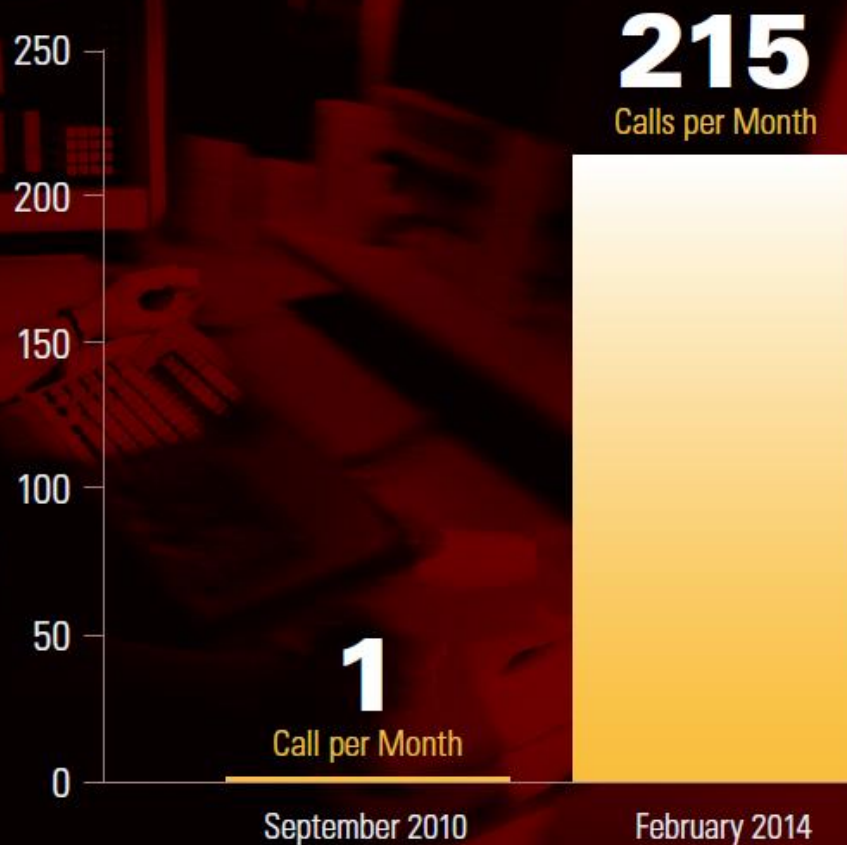
Parts of an e-cigarette structure and substances that may be found in the vapor



Results: Formaldehyde and acetaldehyde were found in 8 of 13 samples. The amounts of formaldehyde and acetaldehyde in vapors from lower voltage EC were on average 13- and 807-fold lower than in tobacco smoke, respectively. The highest levels of carbonyls were observed in vapors generated from PG-based solutions. Increasing voltage from 3.2 to 4.8 V resulted in 4 to over 200 times increase in formaldehyde, acetaldehyde, and acetone levels. The levels of formaldehyde in vapors from high-voltage device were in the range of levels reported in tobacco smoke.

If they are so safe then why ?

Poison center calls involving e-cigarettes



Electronic cigarettes in the USA: a summary of available toxicology data and suggestions for the future



Table 1 Comparison of tobacco-specific nitrosamine levels from nicotine replacement products and tobacco products (ng/g of product wet weight), except for nicotine gum (ng/piece), nicotine patch (ng/patch), e-Cigarette (ng per 16 mg cartridge)

Product Type	Product Brand	NNN	NNK	NAT	NAB	Total
Nicotine replacement product	Nicorette gum (4 mg) ⁴	2.00	ND	ND	ND	2.00
	NicoDerm CQ patch (4 mg) ⁴	ND	8.00	ND	ND	8.00
E-cigarette	Ruyan (16 mg cartridge) ³	3.87	1.46	2.16	0.69	8.18
Smokeless tobacco	Ariva hard snuff ⁴	19	37	120	8	184
	Stonewall hard snuff ⁴	56	43	170	7	276
	Revel packets (wintergreen) ⁴	640	32	310	17	999
	Swedish snus ⁴	980	180	790	60	2010
	Kodiak (wintergreen) ⁴	2200	410	1800	150	4560
Cigarette	Copenhagen snuff ⁴	2200	750	1800	120	4870
	Skoal (long cut straight) ⁴	4500	470	4100	220	9290
	Quest 1 low-nicotine cigarette ⁴	930	170	310	13	1423
	Winston cigarette (full) ⁴	2200	580	560	25	3365
	Newport cigarette (full) ⁴	1100	830	1900	55	3885
	Marlboro cigarette (full) ⁴	2900	750	1100	58	4808
	Marlboro cigarette (ultra light) ⁴	2800	770	1200	55	4825
	Camel cigarette (ultra light) ⁴	2500	900	1700	91	5191
Camel cigarette (full) ⁴	2900	960	2300	100	6260	
Marlboro cigarette (full) ⁴						

NAB: N'-nitrosoanabasine; NAT: N'-nitrosoanatabine; NNK: N'-nitrosornicotine; NNN: 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone. ND, not detected.



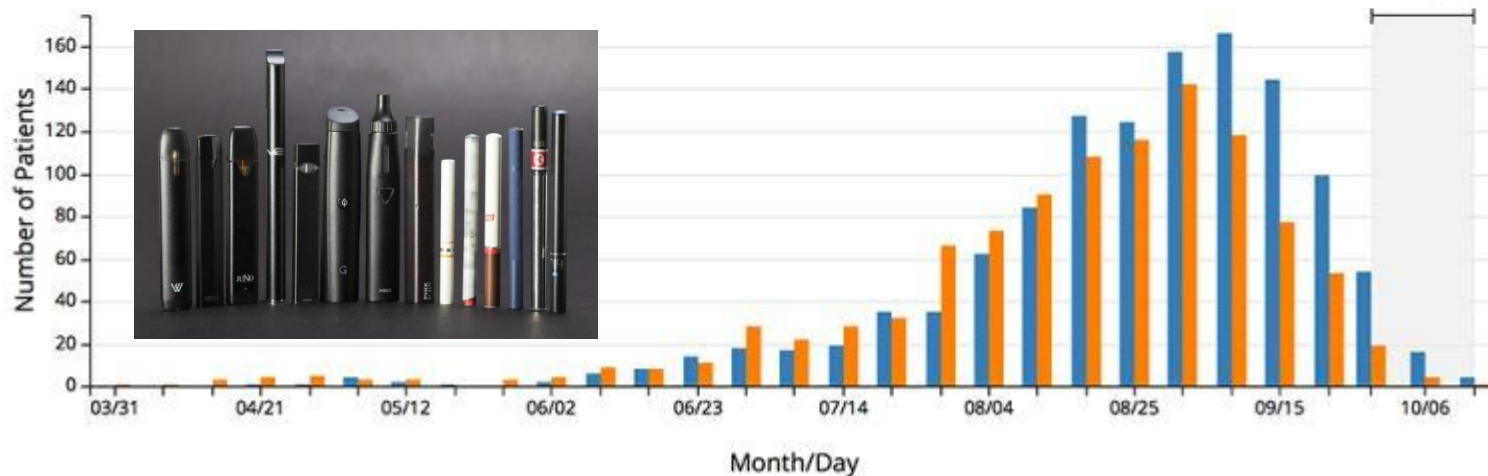
E-cigarette or Vaping Product Use Associated Lung Injury (EVALI)



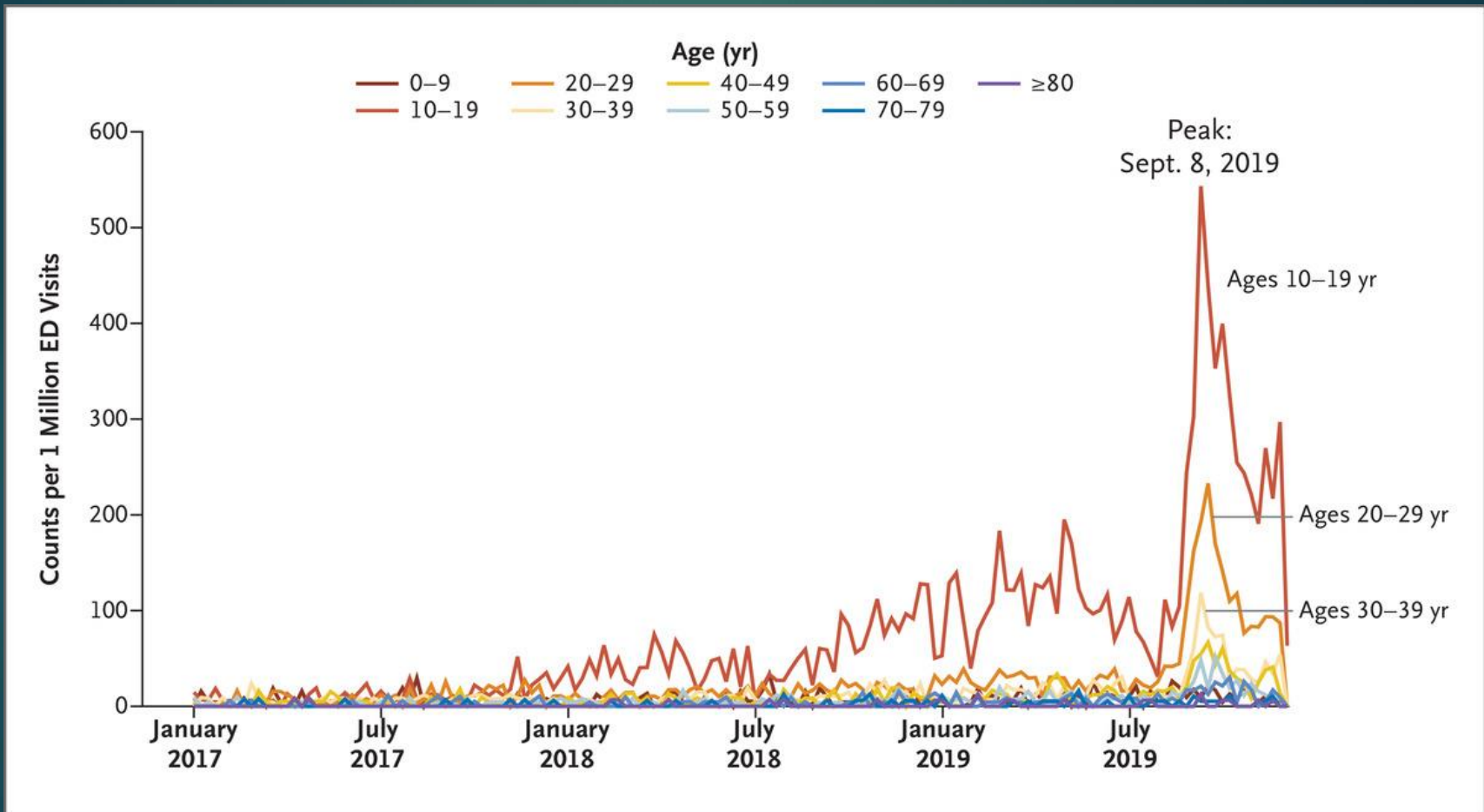
Dates of symptom onset and hospital admission for patients with lung injury associated with e-cigarette use, or vaping — United States, March 31–October 19, 2019

■ Date of Admission (N=1249) ■ Date of Symptom Onset (N=1139)

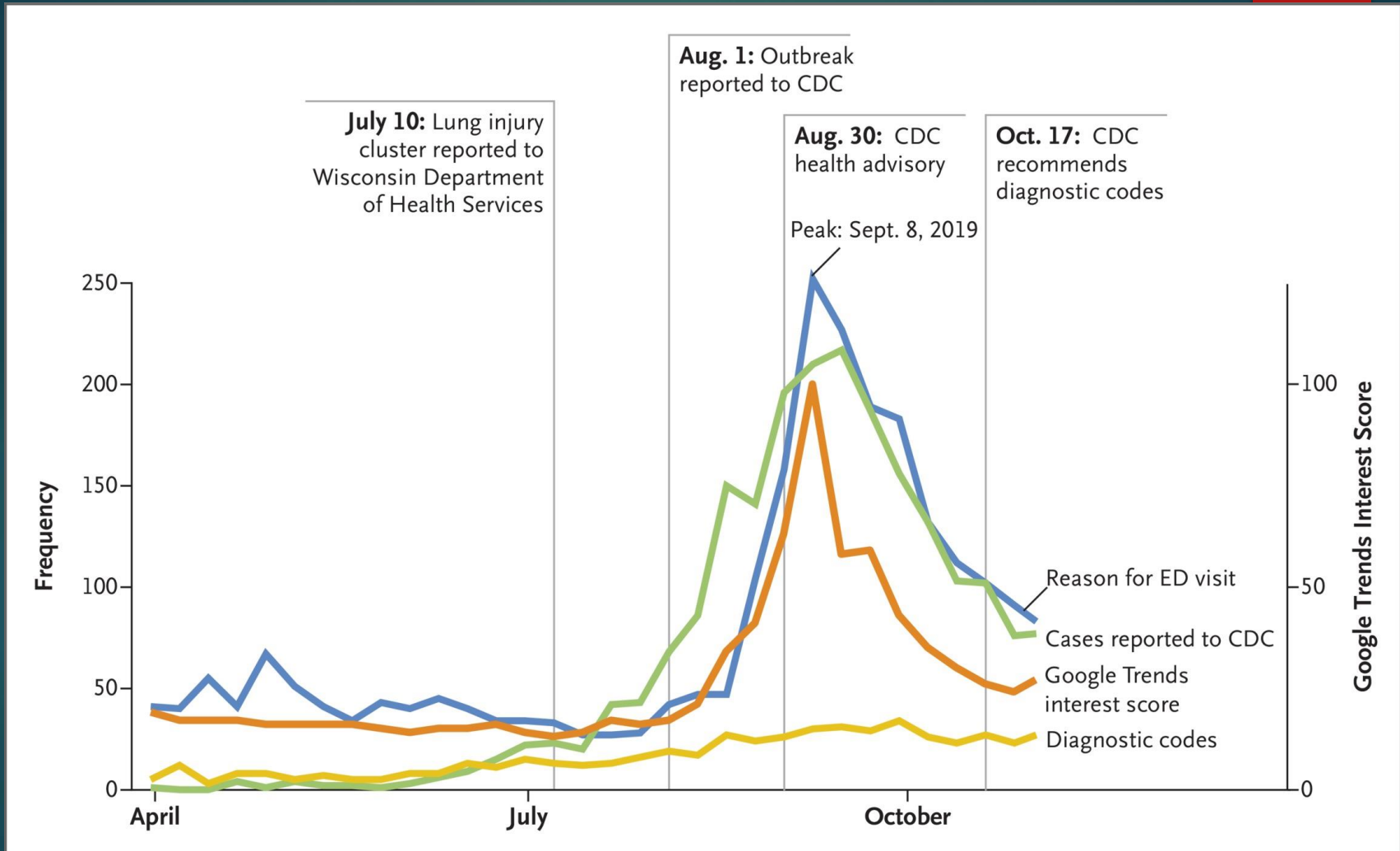
Recent decline in reported onset and hospitalization due in part to reporting lag



Emergency Department (ED) Visits with Electronic Cigarette (E-Cigarette) Product Use as the Reason for the Visit, According to Age Group.

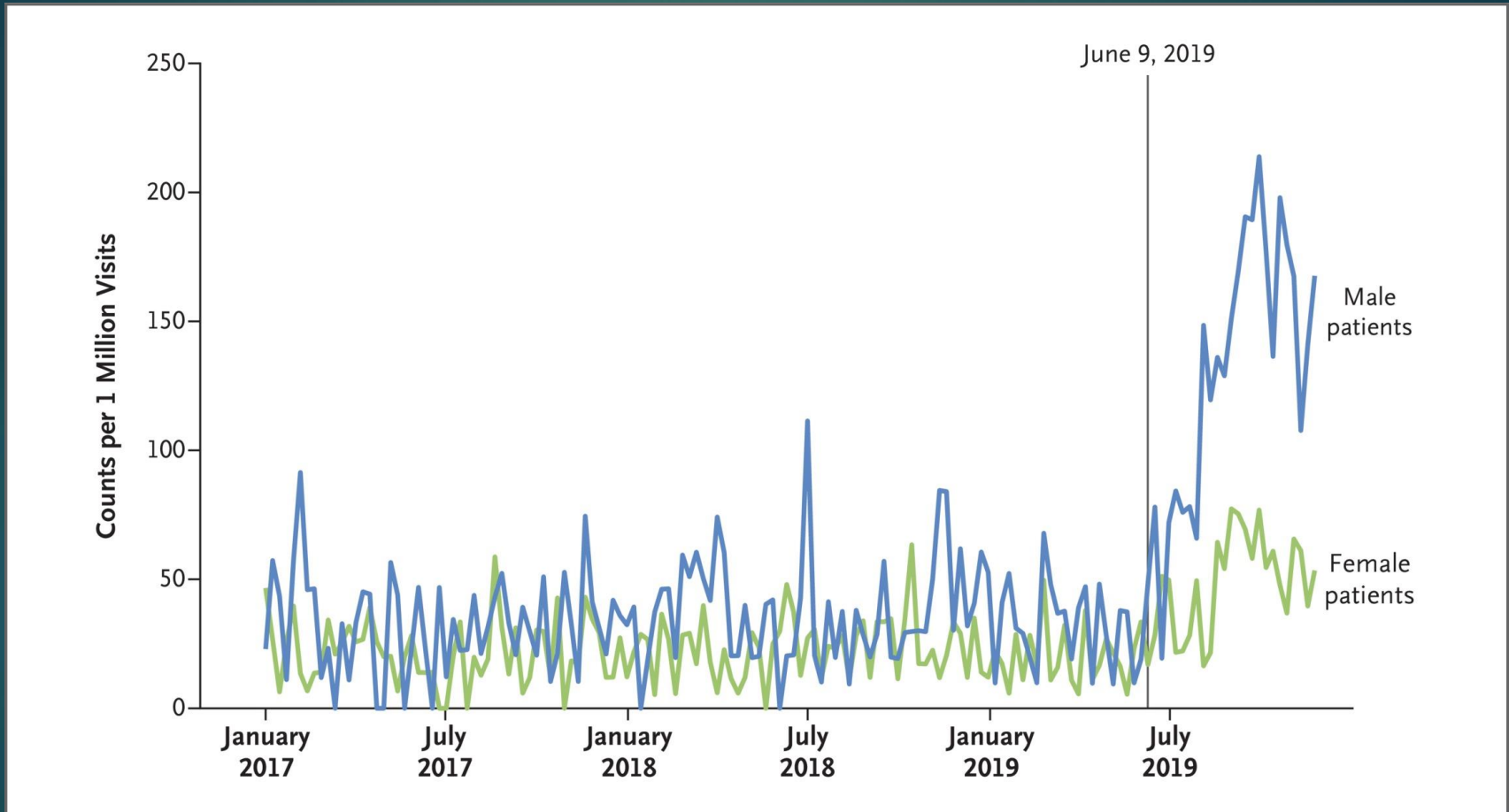


Comparison of Weekly Counts of ED Visits Related to E-Cigarette Product Use.



Hartnett KP et al. N Engl J Med 2020;382:766-772

ED Visits among Persons 11 to 34 Years of Age Who Received Diagnoses Potentially Related to EVALI, According to Sex.



Hartnett KP et al. N Engl J Med 2020;382:766-772



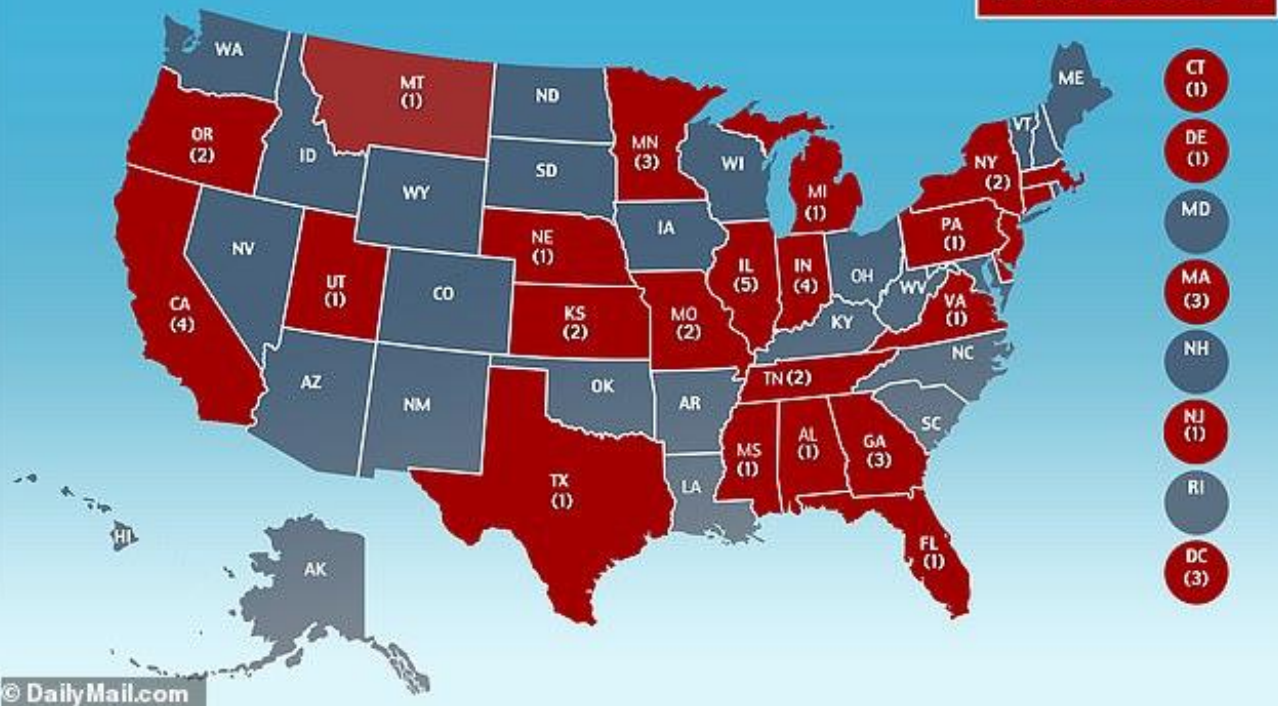
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Vaping related deaths 2019

VAPING DEATHS ACROSS THE US

STATE WHERE VAPE-RELATED DEATH OCCURRED (# OF DEATHS)

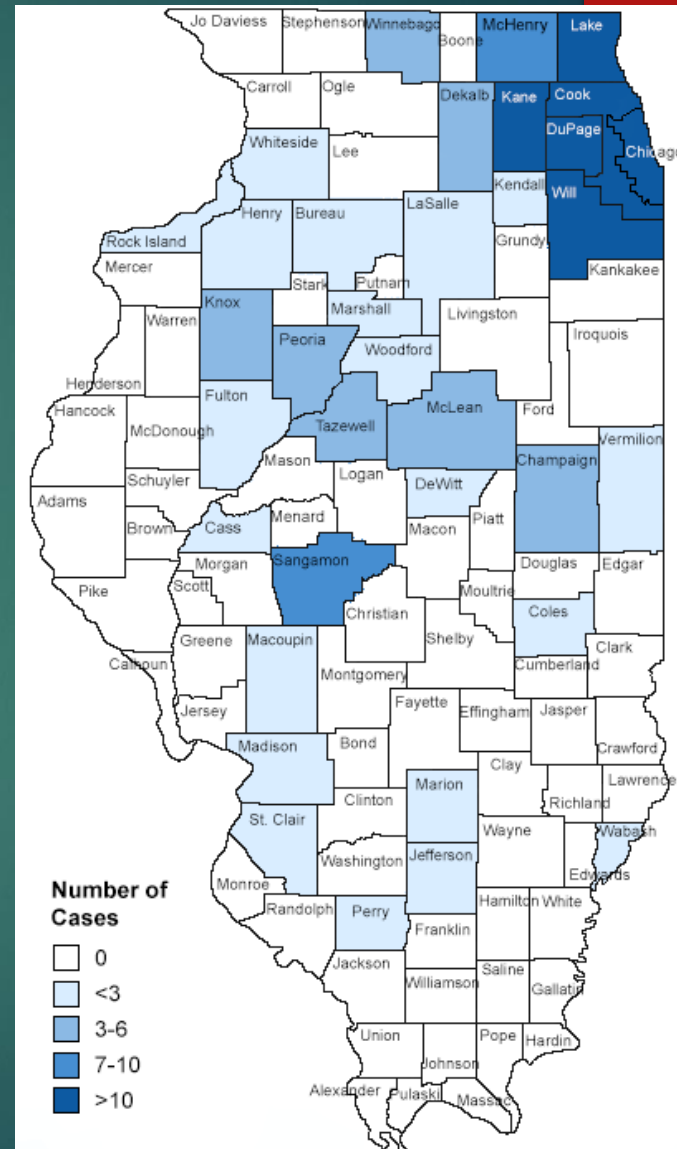
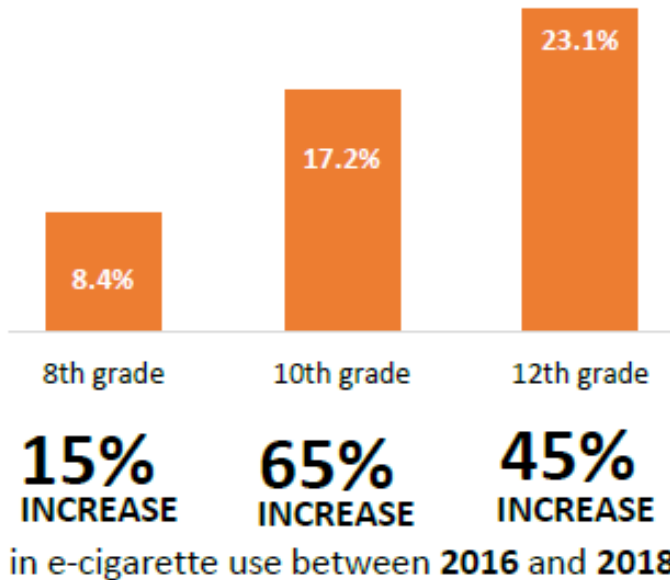
Total Deaths: 47



EVALI – 2019 IL

E-CIGARETTE USE AMONG YOUTH IS NOW EPIDEMIC*

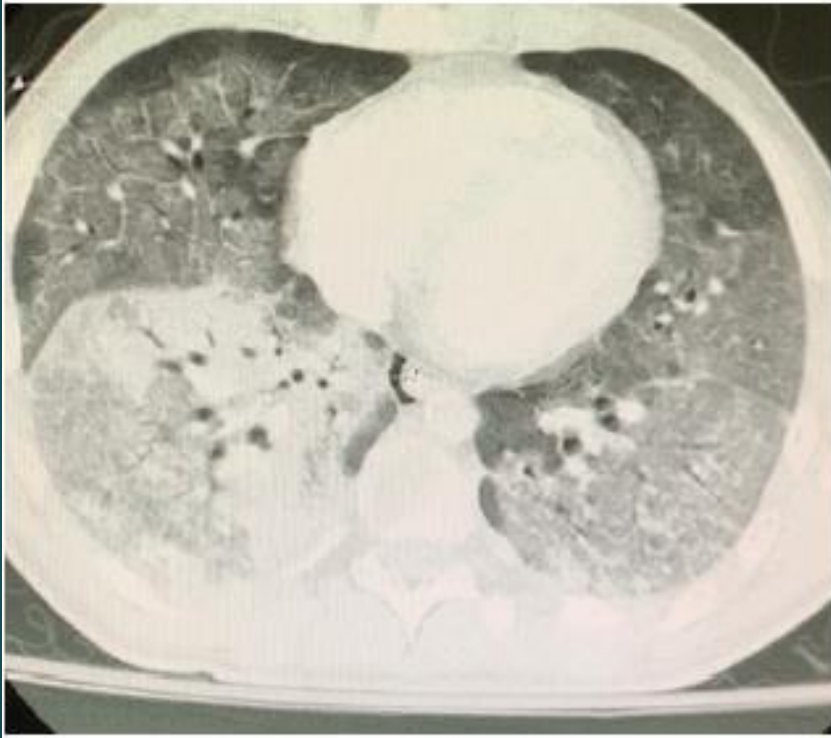
The percent of Illinois teens who first used e-cigs in the past year **increases as grade level increases and is increasing from previous years**



EVALI

- ▶ EVALI may reflect a spectrum of disease processes, rather than a single process.

- ▶ *Figure 2: CT findings of a patient with acute VAPI*



EVALI – Potential Culprils

▶ **THC**

- ▶ ●The majority of patients with EVALI report use of products containing THC (75 to 80 percent)
- ▶ THC (or its metabolites) was identified in 94 percent of patients with EVALI but was undetectable in BAL from healthy individuals.

▶ **Vitamin E acetate**

- ▶ A synthetic form of vitamin E, was initially identified in BAL samples from 29 patients with EVALI from 10 different states [\[19\]](#).

▶ **Nicotine** – Approximately 13 to 58 percent of patients with EVALI report having used nicotine-containing products with or without THC in the 90 days preceding symptom

▶ **Other** – Other oils thought to be potential culprits (eg, **CBD or other plant oils**, [medium chain triglycerides](#), petroleum distillates, terpenes) have not been consistently found in products smoked by patients or in BAL fluid from patients with EVALI

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Vitamin E Acetate in Bronchoalveolar-Lavage Fluid
Associated with EVALI

SPECIAL REPORT

**Syndromic Surveillance for E-Cigarette, or Vaping,
Product Use–Associated Lung Injury**

Kathleen P. Hartnett, Ph.D., Aaron Kite-Powell, M.S., Megan T. Patel, M.P.H.,



Cornering the Suspects in Vaping-Associated EVALI

Terry Gordon, Ph.D., and Jonathan Fine, M.D.

Frequency of Detection of Priority Toxicants in EVALI Case Patients and in Healthy Comparators.

Table 3. Frequency of Detection of Priority Toxicants in EVALI Case Patients and in Healthy Comparators.*

Toxicant	EVALI Case Patients (N=51)	Healthy Comparators			
		Nonusers (N=52)	E-Cigarette Users (N=18)	Cigarette Smokers (N=29)	All Comparators (N=99)
<i>number/total number (percent)</i>					
Vitamin E acetate	48/51 (94)	0/52	0/18	0/29	0/99
Medium-chain triglyceride oil	0/49	0/34	0/11	0/18	0/63
Coconut oil	1/48 (2)	0/34	0/11	0/18	0/63
Plant oil	0/49	0/34	0/11	0/17	0/62
Squalane	0/38	0/52	0/17	0/29	0/98
Squalene	0/38	0/52	0/17	0/29	0/98
α -Pinene	0/39	0/52	0/17	0/28	0/97
β -Pinene	0/39	0/52	0/17	0/28	0/97
3-Carene	0/39	0/52	0/17	0/28	0/97
Limonene	1/39 (3)	0/52	0/17	0/28	0/97
Petroleum distillates	0/12	0/52	0/17	0/29	0/98

* The listed toxicants were detected in bronchoalveolar-lavage fluid obtained from 51 patients with EVALI in 16 states from August through December 2019 and in 99 healthy comparators.

E-CIGARETTES AND PREGNANCY

E-CIGARETTE USE DURING PREGNANCY IS UNSAFE

- E-cigarettes contain nicotine
- Nicotine can damage a baby's developing brain & lungs

WOMEN REPORTED USING E-CIGARETTES

7.0%
at any point
around the time
of pregnancy¹



1.4%
during the
last 3 months
of pregnancy

TAKE ACTION

- Know the risks
- Talk to your healthcare provider about quitting
- Be tobacco-free




¹ Questions asked about use in the 3 months before pregnancy, the last 3 months of pregnancy, or 3–6 months after delivery. Data from the 2010 Oklahoma and Texas Pregnancy Risk Assessment Monitoring System (PRAMS). Kapaya et al. MMWR 2019. doi.org/10.1186/1475-2875-23

Do you know what this



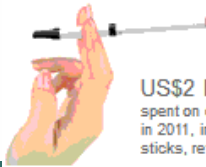
Who bans e-cigarettes?

 banned

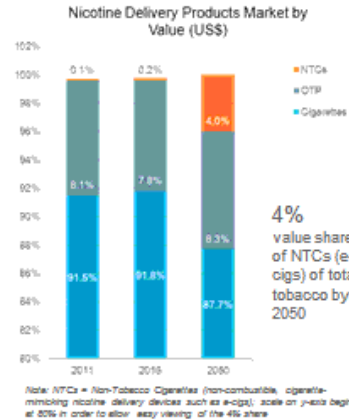


CORPORATE STRATEGIES

Electronic cigarettes: Booming growth



US\$2 billion spent on e-cigs globally in 2011, including all sticks, refills, etc



Source: [E-Cigarette Politics](#)

Top 3 e-cig Markets by Value 2011



60% world value sales. US alone accounts for a quarter of total

So it time to QUIT !!

